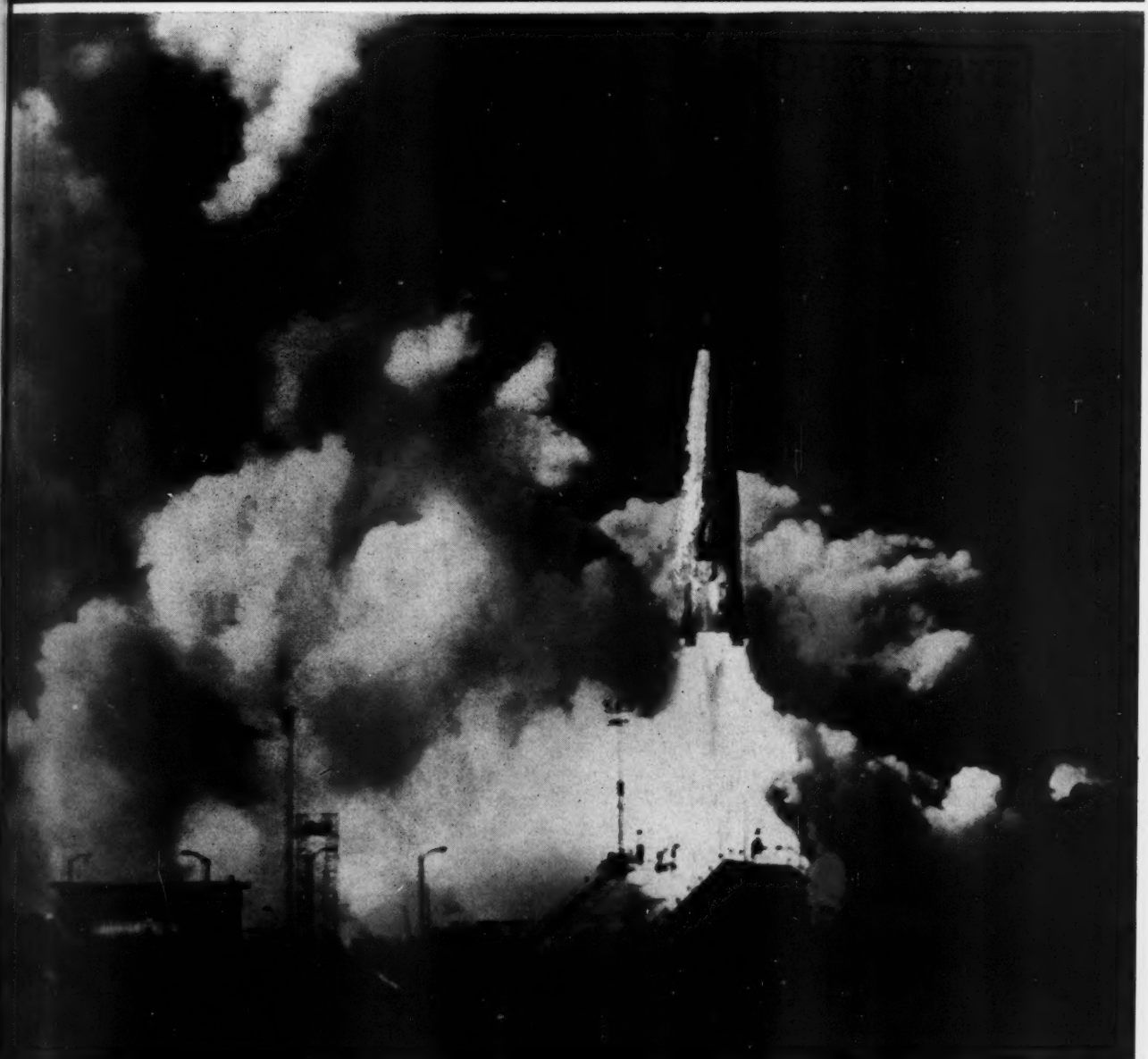
FIRE ENGINEERING

The Journal of the Fire Protection Profession Since 1877



FIRE CHIEFS' CONFERENCE AND BUYERS' GUIDE ISSUE

AUGUST
1958

MAXIM

CO-OPERATION
with the buyer is traditional

Here is one of two special units designed for Louisville.

ANY FIRE CHIEF—ANYWHERE—is welcome to draw on our great wealth of experience in designing and building all types of fire apparatus. One of the best times to visit with us will be September 16th–19th at the IAFC Conference in Los Angeles. Look us up at booth 31.

MAXIM MOTOR COMPANY —MIDDLEBORO, MASS.

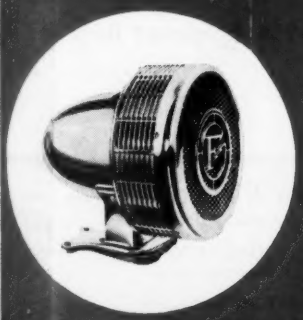
Builders of America's Finest Fire Apparatus

SI

ASSURANCE

INDISPENSABLE in an *EMERGENCY*

You can **have** ASSURANCE with FEDERAL.
It is priceless in an emergency;
you **need** assurance when answering an emergency call—
without it you face hesitation, delay and danger.
However good your vehicle you **can't move**
with maximum speed through traffic
unless you have the best and the most dependable
warning sirens and lights.



The FEDERAL Super Beacon Ray light and Class Q Coaster Siren
on your vehicle will **give** you ASSURANCE;
you know that you can be seen and heard.
Your request for right-of-way won't be ignored.
These signals clear your way with **assurance.**
You are assured of their **dependability,**
durability and **distinction.**

Don't settle for less—be **specific**
and **insist** on the best for your new fire apparatus.
While saving lives and preserving safety for others
don't forget your own life and safety.

FEDERAL SIGN and SIGNAL Corporation

8702 S. State St., Chicago 19, Ill.

FIRE ENGINEERING

VOL. 111 AUGUST, 1958 NO. 8

IN THIS ISSUE

The Hour of Decision—*An Editorial*
By Roi B. Woolley 669

How the Los Angeles Fire Department Achieves Its High Objectives—By Deputy Chief Charles W. Bahme 670

Los Angeles County Fire Department—Progress and Problems—By Cliff Dektar 673

A Survey of Rocket Propellants
By Paul F. DeGaeta and Arnold A. Weintraub..... 676

What Chiefs Prefer in Fire Hose—
A Special Staff Report 680

I.A.F.C. Incorporates Fire Administration Institute 683

Epic of the East River 684

Fire Service Photography Pays Off—By Frank Hanafin 686

Our Neglected Fire Alarm Systems—By Roi B. Woolley 689

Badges, Buttons and Braid—By Clarence E. Meek ... 692

Wanted: A Public Relations Program!
By Irving Hirschbein 707

Training Fire Department Rescue Personnel
By Donald M. O'Brien 710

I.A.F.C. Conference Personalities and Program .. 714

Instruments to Ferret Out Hidden Hazards—A Special Study 718

The Case for High Pressure Fog—A Staff Report ... 721

How Con Edison Trains Its Personnel
By W. E. Rossnagel 724

Modern Fixed Fire Control Systems
By Donald M. O'Brien 727

Joint L. A. County-City Forces Control Goldwyn Studio Blaze—By Cliff Dektar..... 731

Fashions in Fire Fighters' Apparel—By Sidney Wohlfeld 732

DEPARTMENTS

Manufacturers News 735

False Alarms 755

Among the Buffs—By Paul C. Ditzel 770

The Watch Desk 774

Questions and Answers 791

Our Readers Write Us 796

The Round Table 804

What's Burning 812

Where to Buy—1958 Equipment Directory 743

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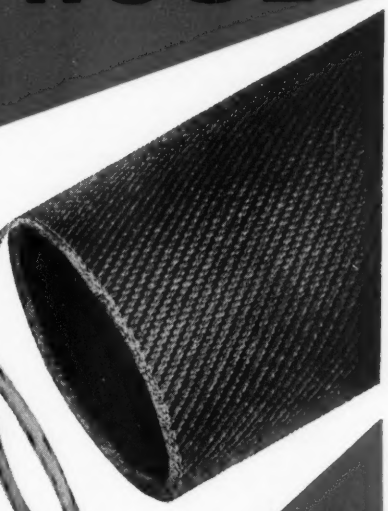
Fabric FIRE HOSE

PRESENTS



FABRIC UNISPUN FIRE HOSE

WITH

WEATHERMATE PROTECTION

AND

PRES-R-LOCK COUPLINGS

WRITE US or CONTACT YOUR Authorized FABRIC Representative

FABRIC FIRE HOSE COMPANY

EXCLUSIVE MANUFACTURER OF FIRE HOSE SINCE 1869

SANDY HOOK, CONN.

IN CANADA *Pierre Thibault* CANADA, LTD., LTEE., PIERREVILLE, QUEBEC

M-S-A CHEMOX.® Complete breathing protection in oxygen-deficient or unbreathable atmospheres. Pure oxygen, released from the replaceable chemical canister the instant the wearer breathes, continues automatically in accordance with the breathing demands. Minimum of 45 minutes' protection under rugged working conditions.

The Chemox is light—only 13½ pounds; comfortable. Canisters can be stored indefinitely—are always ready. M-S-A "Cleartone" Speaking Diaphragm, permits clear communication between mask wearers.

M-S-A AIR-MASK. Designed for respiratory protection and comfort in unbreathable atmospheres. Supplies air or oxygen in exact accordance with breathing needs. During exhalation, the flow ceases —an economy measure that greatly lengthens service life. Construction details include —large, well-defined figures on pressure gauge . . . high pressure hose made of wire-inserted neoprene . . . redesigned cylinder valve connects directly to the cylinder; provides greater service, less maintenance . . . nylon harness resists chemicals and water.

M-S-A "ALL-SERVICE" MASK.® For fire-fighting efforts in air contaminated with smoke and gas, but where sufficient oxygen is present to support life, the "All-Service" Mask assures dependable breathing protection to the wearer. Unit is designed for freedom of movement and wearing comfort. "All Vision" facepiece, combined with M-S-A "Cleartone" Speaking Diaphragm for clear speech transmittal are additional features that make this mask ideal for effective fire fighting. Each "All-Service" mask comes in a strong carrying case; ample room for extra canisters.

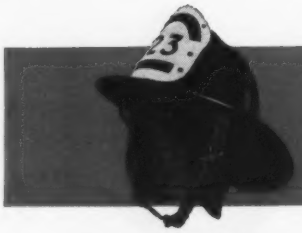
INCREASE YOUR FIRE-FIGHTING EFFICIENCY AND SAFETY WITH PROVED M-S-A® EQUIPMENT

Providing your plant fire department with the best possible equipment is a big step forward in fire-fighting speed and safety. Workmen, confident of the equipment they wear and have available in case of injury, concentrate fully on the job to be done. M-S-A products for Fire Departments are known everywhere for the confidence they give to fire-fighters. Some of our equipment is illustrated and described here. If you would like complete information, write for our Fire Department Catalog. You'll find it profitable reading.

MSA
SAFETY EQUIPMENT HEADQUARTERS

Call the M-S-A man on your every safety problem . . . his job is to help you

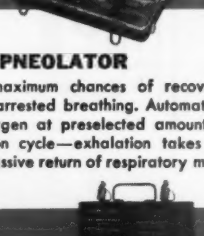
MINE SAFETY APPLIANCES COMPANY
201 North Braddock Avenue, Pittsburgh 8, Pa.
At Your Service: 76 Branch Offices in the United States
MINE SAFETY APPLIANCES CO. OF CANADA, LTD.
Toronto, Montreal, Calgary, Edmonton, Winnipeg, Vancouver, Sydney, N.S. • Representatives in Principal Cities in Mexico, Central and South America
Cable Address: "MINSAF" Pittsburgh



M-S-A STREAMLINED FIREMAN'S HELMET
Molded laminated plastic shell takes bumps and blows; withstands water, oil, heat; provides high dielectric strength. Streamlined design; shields are of tough, full-grained leather; zipped-in winter liner for all-weather comfort.

M-S-A PNEOLATOR
Assures maximum chances of recovery in all cases of arrested breathing. Automatically provides oxygen at preselected amount, pressure. No suction cycle—exhalation takes place by normal passive return of respiratory muscles.

M-S-A FOILLE SPRAY KIT
Four aerosol sprays for quick, effective application to burned areas. Aerosol application is fast, effective, always ready. Contains a complete assortment of first aid dressings and accessories. Weatherproof steel case.



M-S-A FIRST AID KIT
Unit packages are individually wrapped in tear-taped cellophane to protect against dirt, dust and moisture. All-weather steel case design. Treatments contained in unit packages for quick location, individual treatment.

B.F.Goodrich

Now they squeeze hundreds of extra feet of hose on truck

THAT B.F.Goodrich hose on the right coils tighter than the ordinary hose shown with it because it's lighter, much more flexible. Hundreds of extra feet of hose can be racked on the truck—up to a third more on a standard truck. Firemen like it because it racks naturally on the truck bed, saves loading time after a fire.

The flexibility and lightness of this hose comes from the Dacron chemically-produced fiber used as "filler" cords which go around the hose and carry the load under pressure. These cords are thinner, yet stronger than cords used for reinforcement on heavier, bulkier hose. It is tested to 600 pounds pressure and can stand up to twice as much pressure without bursting.

For areas where excess moisture is a problem, B.F.Goodrich has developed the exclusive Superseal protection for hose that makes it 10 times more resistant to mildew attack and rotting. Most treatments just coat the surface of the hose, but Superseal penetrates every cord of the inner and outer jacket, preparing the hose for all kinds of weather. Superseal protection costs no more than ordinary hose treatments.

When you want a hose that's light, flexible, and will last longer than any other hose made, get B.F.Goodrich hose with Superseal protection. Your B.F.Goodrich fire hose distributor can tell you more about it, or write *B.F.Goodrich Industrial Products Company, Dept. M-405, Akron 18, Ohio.*

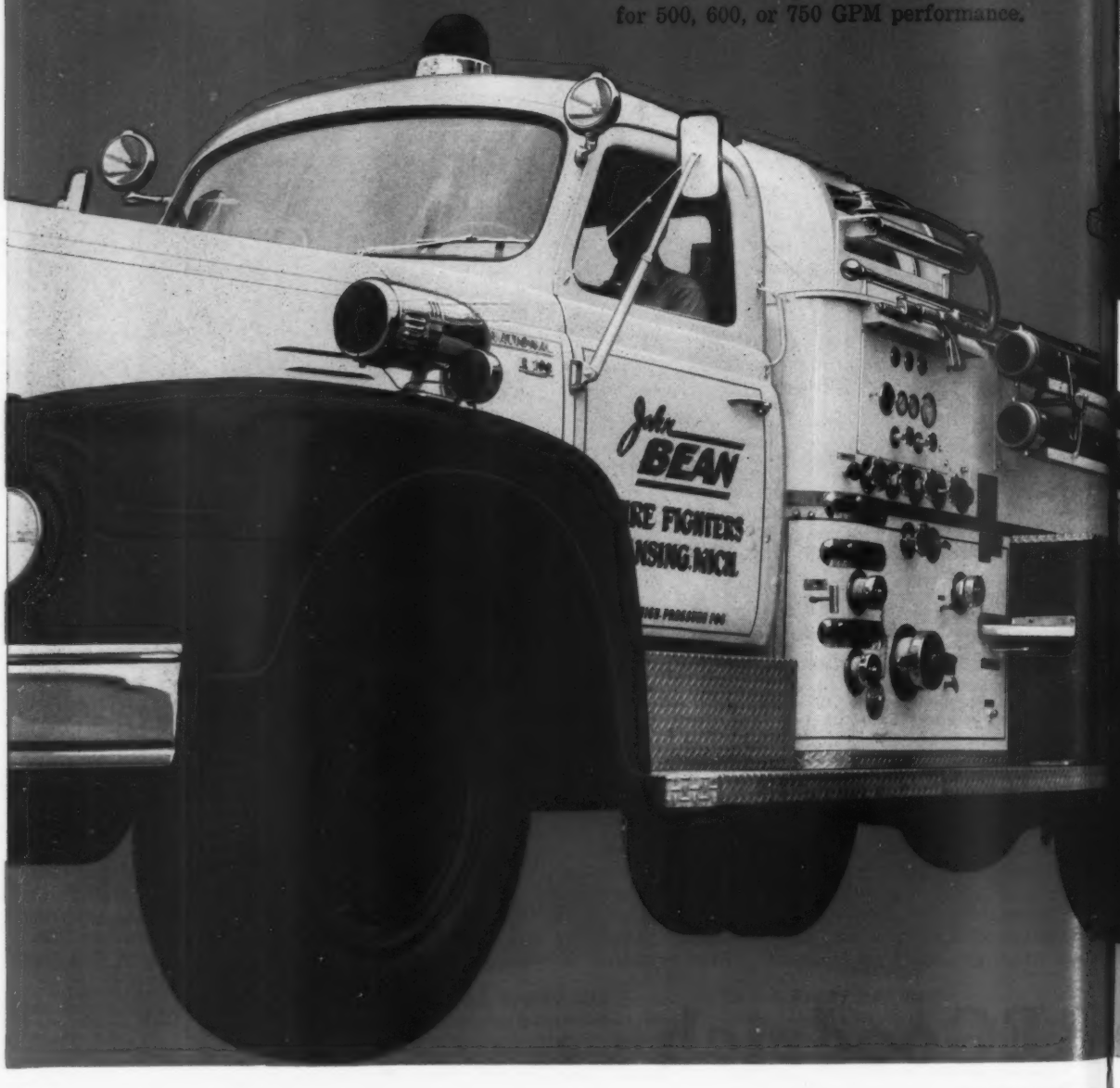
B.F.Goodrich *industrial products*

The Scientific Approach

. . . choose from the complete line of

HPV . . . high pressure fog and volume
with the double power of 2 great pumps

Two proven methods — high pressure fog that cools, smothers and isolates flames, plus Underwriters' approved volume streams — give you an unbeatable combination. The John Bean High-Pressure Fog pump delivers 60 GPM at 850 PSI pump pressure — and the John Bean Class A centrifugal volume pump is available for 500, 600, or 750 GPM performance.



for that INSTANT PUNCH

John BEAN high-pressure fog apparatus

The instant punch of John Bean high pressure fog stops fires **before** they grow. Microscopic size fog particles provide maximum heat absorbing effect with **any** type fire. This scientific approach, with the original John Bean high pressure fog, extinguishes 95% of your fires faster — with little or no water damage. That's why so many fire departments select John Bean fire apparatus.

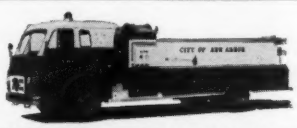
HPF . . . high pressure fog equipment that makes water go 10 times as far. Fighting fires on the run or stationary, there's no problem of water source. One gallon of water as high pressure fog has the fire killing capacity of ten or more gallons discharged in a conventional stream.

LITTLE BEAN . . . high pressure fog plus extra mobility for instant action

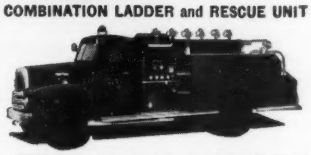
Built for speed, compactness and easy handling, the "Little Bean" high-pressure fog fire fighter is ideal for your "first out" unit — and as an all-around fire fighter for smaller and rural departments — for the fast knockout of forest, grass and brush fires — for airport and industrial plant protection.

MULTI-PURPOSE high pressure fog equipment

Apparatus shown at right is typical of special purpose units engineered by John Bean. These fire fighters are designed to accommodate all types of accessory tools and emergency equipment such as salvage and rescue equipment, forceable entry tools, ladders, light generators, flood lights, two-way radio, walkie-talkie, acetylene cutting torches, portable power saws and drills, first aid equipment, and regular fire department tools and appliances.



COMBINATION LADDER and RESCUE UNIT



COMBINATION SQUAD and RESCUE UNIT

John BEAN fmc

Lansing 4, Michigan San Jose 1, Calif.

ORIGINAL HIGH-PRESSURE FOG FIRE-FIGHTERS

Food Machinery and Chemical Corporation

SEND COUPON for details TODAY

John BEAN Division of Food Machinery and Chemical Corp.
Lansing 4, Michigan San Jose 1, California

Please send me literature on the following fire fighters:

☐ HPV — high pressure fog and volume ☐ HPF — high pressure fog
☐ Little Bean high pressure fog ☐ Multi-Purpose high pressure fog equipment

Name_____

Address_____

City_____ State_____

Buried for two months . . . no trace of mildew!

No mildew in Hamilton's Energy 600-lb. test fire hose after two months' burial in mildew-infested earth! That's the defense Sealcott "W" gives Energy—and also Hamilton's Flexrite 400-lb. test hose. Sealcott "W" gives maximum assurance against moisture absorption, and freezing. Flexibility and tube adhesion are not affected.

ENERGY and FLEXRITE hose are 20% lighter than conventional types. Both use Dacron filler cords in the jackets to increase strength and flexibility, while reducing bulk and weight. Smooth non-porous tubes, free at points of fold for greater flexibility, are non-acid forming, oxygen bomb tested, slow aging. Write Dept. F-103.

COILS IN LESS SPACE

Serving Industry since 1870

Hamilton Rubber

MANUFACTURING CORPORATION, TRENTON 3, N. J.

A Division of Acme-Hamilton Manufacturing Corporation

ATLANTA • CHICAGO • HOUSTON • PITTSBURGH • INDIANAPOLIS • LOS ANGELES • NEW YORK • SAN FRANCISCO

PhonAlarm TRADE MARK

PATENTS PENDING

the most modern fire and public emergency reporting system available . . . . . .

CHECK THE LIST

Q. What Is PHONALARM?

A. PHONALARM Is the Only *Combination Telephone* and *Telegraph Fire* and *Emergency Reporting System* Which Operates Over a Single Wire Fire Alarm Loop. It is Specially Engineered to Provide *All* the Reliable Features of a Telegraph System *Plus* the Flexibility of a Telephone System.

Q. How Does PHONALARM Work?

A. PHONALARM Is Simply Operated by the Caller Picking Up a Telephone Handset in the Corner Phonalarm Box Which *Automatically Transmits* a Telegraph Code to the Control Office Identifying the Box Location and *Immediately* the Caller Is Able to *Talk* Directly to the Operator at the Central Office and Can *Immediately* Report the *Exact Location* of the Fire or the Nature of His Emergency Call.

Q. Will PHONALARM Operate on My Present Telegraph Central Office System?

A. Yes. PHONALARM Is So Flexible That It Will Operate on Any Existing Central Office System Whether Old or New.

Q. Can PHONALARM Boxes Be Used with Our Present Telegraph Boxes?

A. Yes. PHONALARM Boxes Will Operate in Perfect Harmony When Mixed on the Same Circuit With Telegraph Boxes or If You Desire, Can Be Put on Separate Circuits.

Q. Who Owns the System?

A. Your Municipality Owns the System and Has Full Control of It At All Times, at Remarkably Low Costs of Installation and Maintenance.

Q. Who Is Using PHONALARM?

A. The Most Recent Installations Were Made at Los Angeles, California, Nashville, Tennessee, Tacoma, Washington and Santa Monica, California.

Q. Where Can I Get More Information on PHONALARM?

A. By Filling Out Return Reply Coupon . . .

PhonAlarm

Division of ANGELUS INDUSTRIES, Inc.
5353 Strohm Avenue
North Hollywood, California
STanley 7-5431

Please send me data on PHONALARM
Division of Angelus Industries, Inc.
5353 Strohm Avenue, North Hollywood, California
STanley 7-5431

Name ..... **Title** .....

Address: .....

City: .....

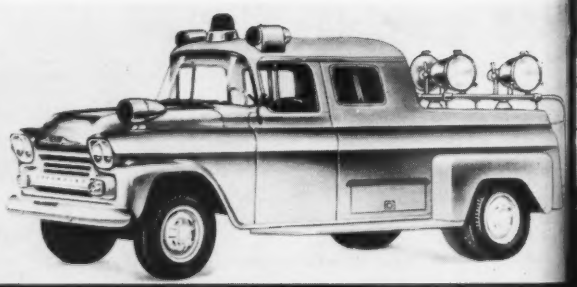
a 3-in-1 unit

IMMEDIATELY IDENTIFIABLE!

*NOT JUST "CUSTOM BUILT" BUT ENGINEERED AND CRAFTED BY MASTERS FOR THOSE WHO WANT SAFETY AND PERFORMANCE AS WELL AS ELEGANCE.

FIVE TO TEN MEN SEDAN TYPE SQUAD PUMPER

"Cruiser" Ambulance. Twice the headroom found in ordinary ambulances. Also chief's or first-aid car.



Five to ten men sedan type flood or rescue car.

TESTIMONIALS

Here is a typical letter—one of many we receive from all parts of the country. We'll be glad to send you copies of others upon request.

WEIRTON VOLUNTEER FIRE DEPARTMENT, INC.
COMPANY No. 1
WEIRTON, WEST VIRGINIA

June 16, 1958

Mr. Edward Christopher Califano
President
The Christopher Company
New York, New York

Dear Sir:

The Firemen Parade season is getting in full swing in the Tri State Area and I bet I gave your address to one hundred (100) different fire companies in the past week.

Our RES-Q Truck was entered in four (4) parades the past week and in competition with about thirty (30) other emergency units, we won first prise all four (4) times. We are really proud of our RES-Q Truck. Thanks to your Company.

We will go to many more parades and I am sure of many more first prises as there are no RES-Q trucks to come near ours.

If you have any new literature on your models, please send them to me and I feel very sure of some business for you.

Hoping to hear from you soon.

Sincerely yours,
Andrew J. Kondik
Andrew J. Kondik, Pres.
Activities Committee
Weirton Volunteer Fire Department
Companies 1 and 2

A 3-IN-1 UNIT

RESCUE CAR + AMBULANCE + SQUAD CAR = RES-Q

Carries 4 stretcher patients, 12 men and 20 compartment areas for all types of emergency equipment. (see photos opposite)

AVAILABLE IN ANY COMBINATION DESIRED

THE CHRISTO

Division of International Auto-Industries Corp.

a 4-in-1 unit

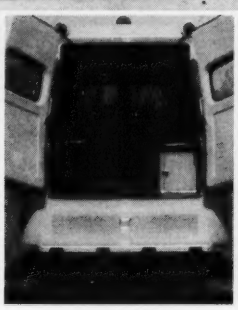
*IMITATED MAYBE, DUPLICATED NEVER!

"There is hardly anything in the world some man cannot make a little worse and sell a little cheaper,—and the people who consider price only are this man's lawful prey."

—JOHN RUSKIN

New full height rear doors

Seat is hinged for easy installation of cot



With seat down for use as squad car

Compartments for pump controls, generator and emergency equipment

A 4-IN-1 UNIT

PUMPER + RESCUE CAR + AMBULANCE + SQUAD CAR

=F.A.P.A.

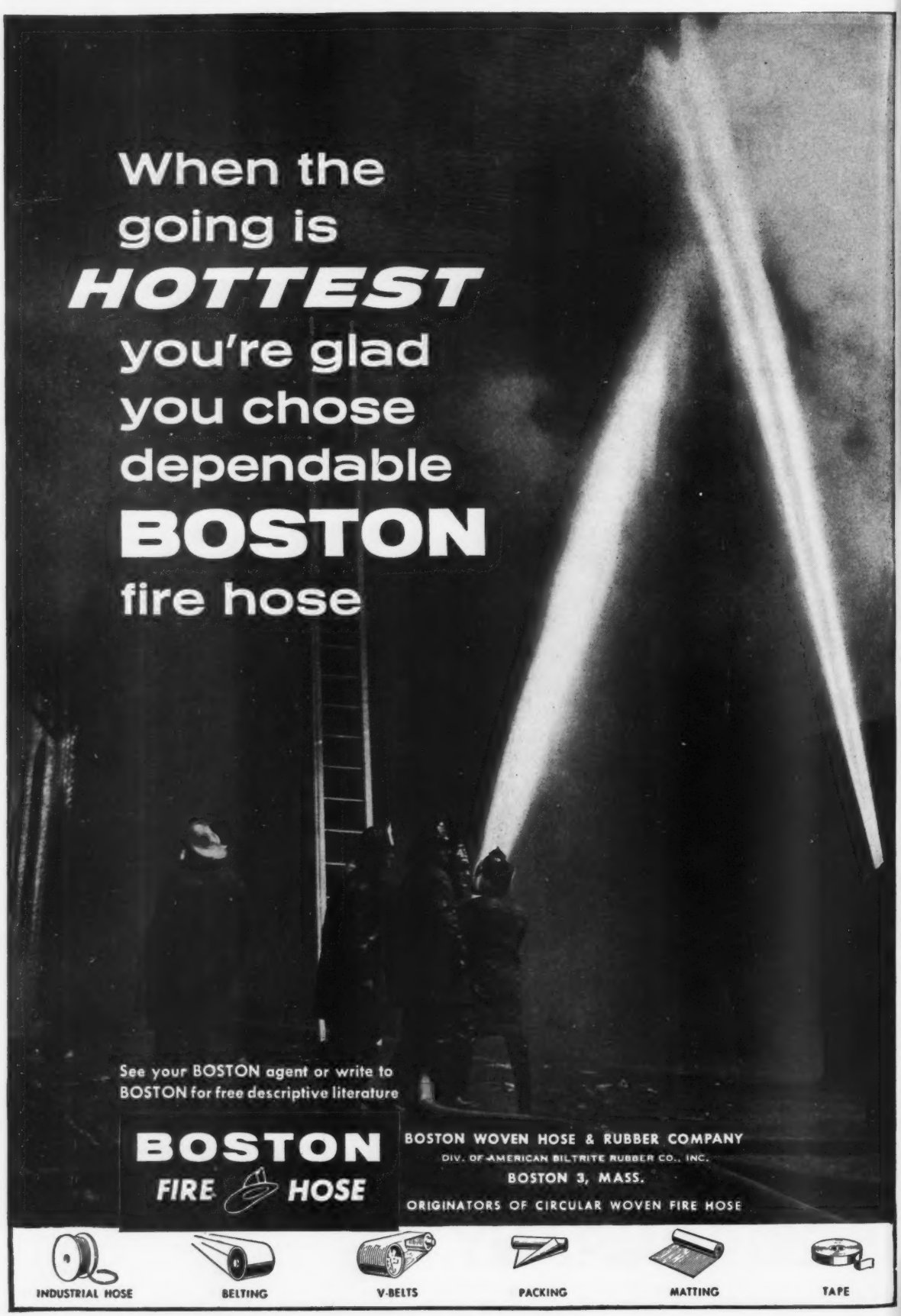
— WRITE OR PHONE

PHER COMPANY

100 Central Park South, New York 19, New York

Carries 12 people as squad car. Four stretcher patients, as an ambulance. 150 to 200 gallons of water. Hale 200 gpm pump, and soft suction plus 1½" hose, Stainless steel foam tank with automatic proportioner to discharge 6,000 gallons of foam, for oil fires, Drafts from stream, hydrant or tanker on both sides of vehicle, plus booster reel on rear. Compartments for: Portable generator—portable pump—oxy-acetylene cutting outfit, flood lights, oxygen, respiratory equipment etc.

***INTERNATIONAL PATENTS ISSUED AND PENDING**


When the
going is
HOTTEST
you're glad
you chose
dependable
BOSTON
fire hose
See your BOSTON agent or write to
BOSTON for free descriptive literature
BOSTON
FIRE HOSE
BOSTON WOVEN HOSE & RUBBER COMPANY
DIV. OF AMERICAN BILTRITE RUBBER CO., INC.
BOSTON 3, MASS.
ORIGINATORS OF CIRCULAR WOVEN FIRE HOSE
INDUSTRIAL HOSE
BELTING
V-BELTS
PACKING
MATTING
TAPE

SIMPLICITY...

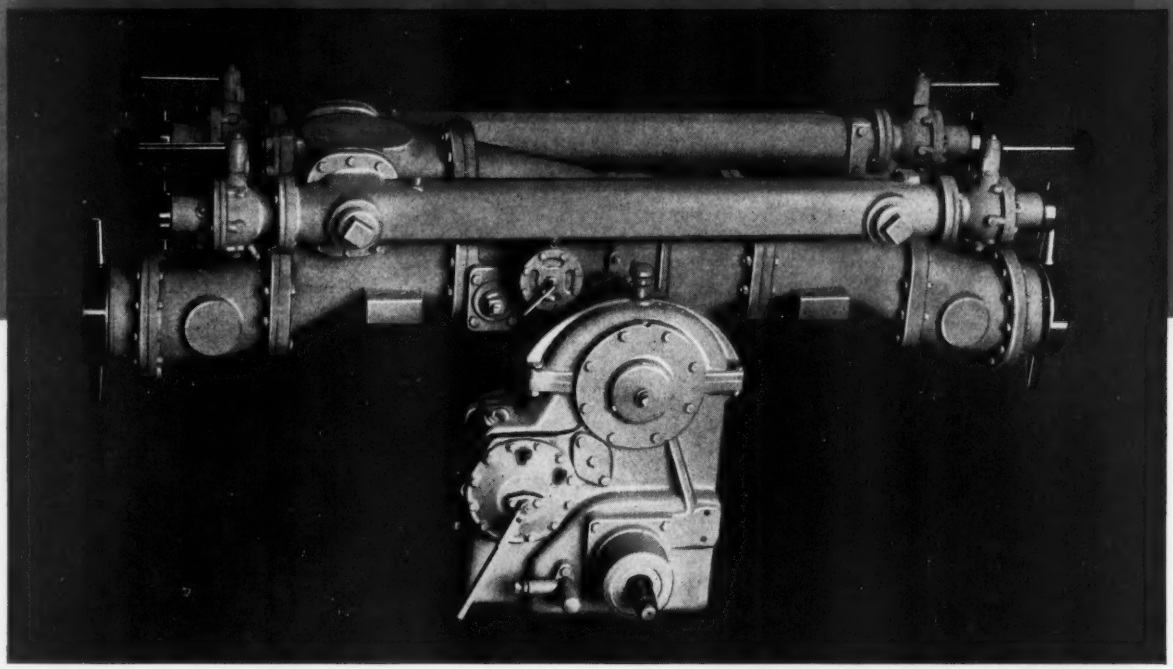
For years the complexity and the over-all cost of pumpers have been increasing. Hale has constantly worked to reverse this trend—and at the same time produce even more efficient pumps.

Now, by taking advantage of the greatly increased speed range of today's engines, Hale has produced a new series—the "Hi-Stage"—not only extremely simple to operate but simpler in design and at a lower over-all cost.

Efficient and clean-cut in design, the new HALE "Hi-Stage" Centrifugal Fire Pumps exceed with ease the Class A Underwriters' ratings shown below.

Every "Hi-Stage" gives the operator instant command of the complete pumping range with one control —the engine throttle.

We believe the "Hi-Stage" pumps represent one of the most useful forward steps in practical fire fighting in many years.

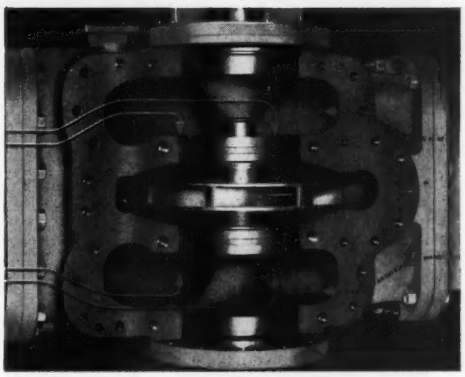


Underwriters' Class A Ratings:

Model	Ratings
• QSM10	1000 GPM at 150 lbs.
• QSM12.5	1250 GPM at 150 lbs.
• QSM15	1500 GPM at 150 lbs.

PLUS FEATURES:

- Simplicity of Design and Operation . . . No Transfer or Check Valves.
- Double Suction Impeller . . . water feeds into both sides of impeller from either side of apparatus . . . for Volumes substantially over Pump's Rated Capacity.
- Large, Streamlined Waterways and reduced Impeller Disc Friction for Maximum Efficiency.
- Many Gear Ratios Available so that Pumps can take advantage of a Wide Choice of Engines and Speeds.
- Push-Button Priming.
- New, Simplified Panel-Mounted Relief Valve Control.
- Extra Rugged Pump Body and Bearings for Long Life.
- Notable for Serviceability.

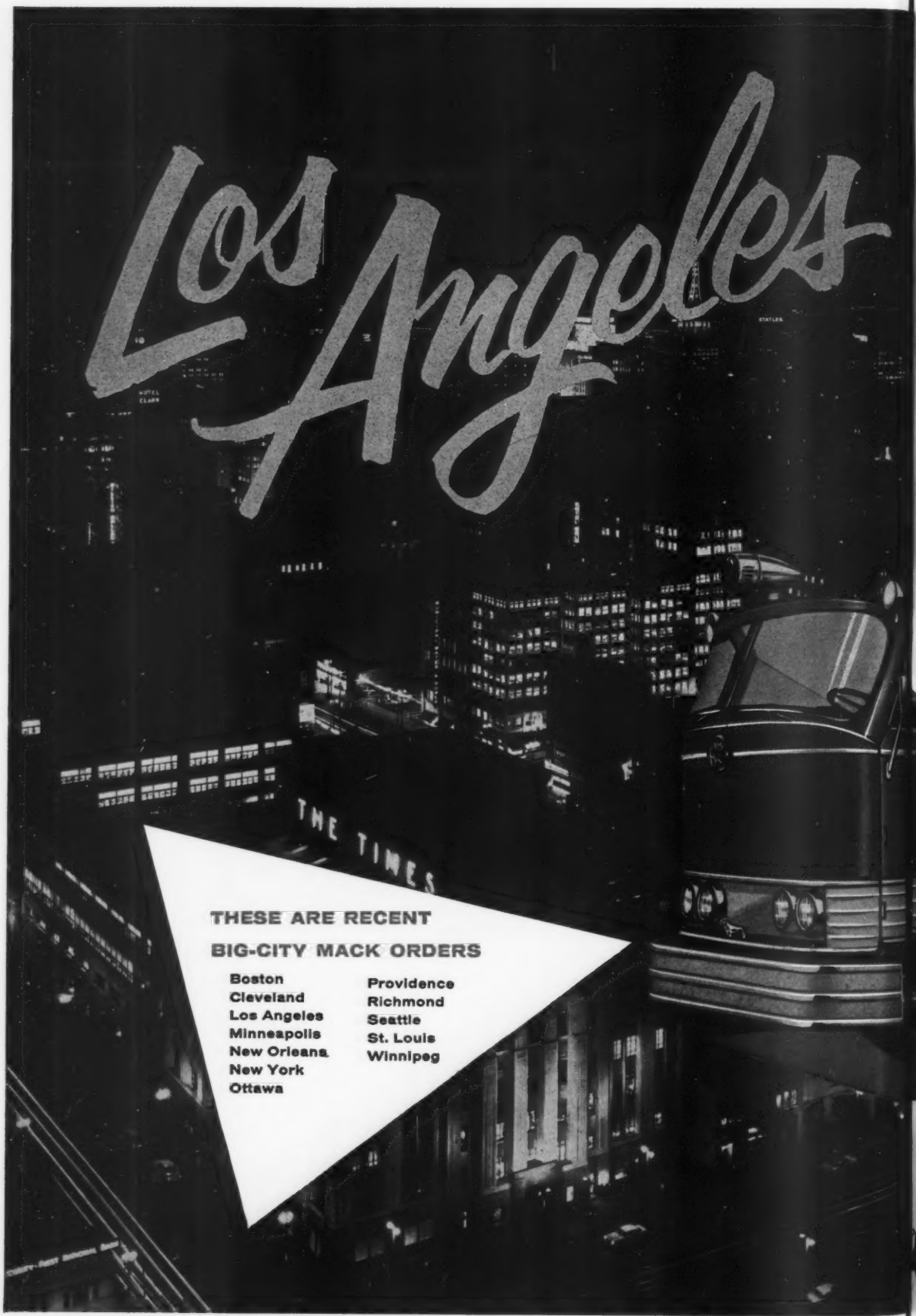


This diagram shows how water feeds into the Hale Double Suction Impeller from either side of apparatus. Solid red arrows show water coming into impeller when suction is feeding from left side of apparatus; broken lines show direction of water if suction is taken from right side of apparatus.

NOTE: Be sure to see the HALE display in Booth #64 at the Los Angeles Convention.

Write today for Bulletin No. 365 on the "Hi-Stage" series, and other valuable information on Hale fire pumps . . . built in all standard capacities.

HALE FIRE PUMP COMPANY
CONSHOHOCKEN, PENNSYLVANIA


Los Angeles
THE TIMES
THESE ARE RECENT
BIG-CITY MACK ORDERS
Boston
Cleveland
Los Angeles
Minneapolis
New Orleans
New York
Ottawa
Providence
Richmond
Seattle
St. Louis
Winnipeg

adds 5 new Mack pumpers

. . . joins the BIG-CITY swing to Macks

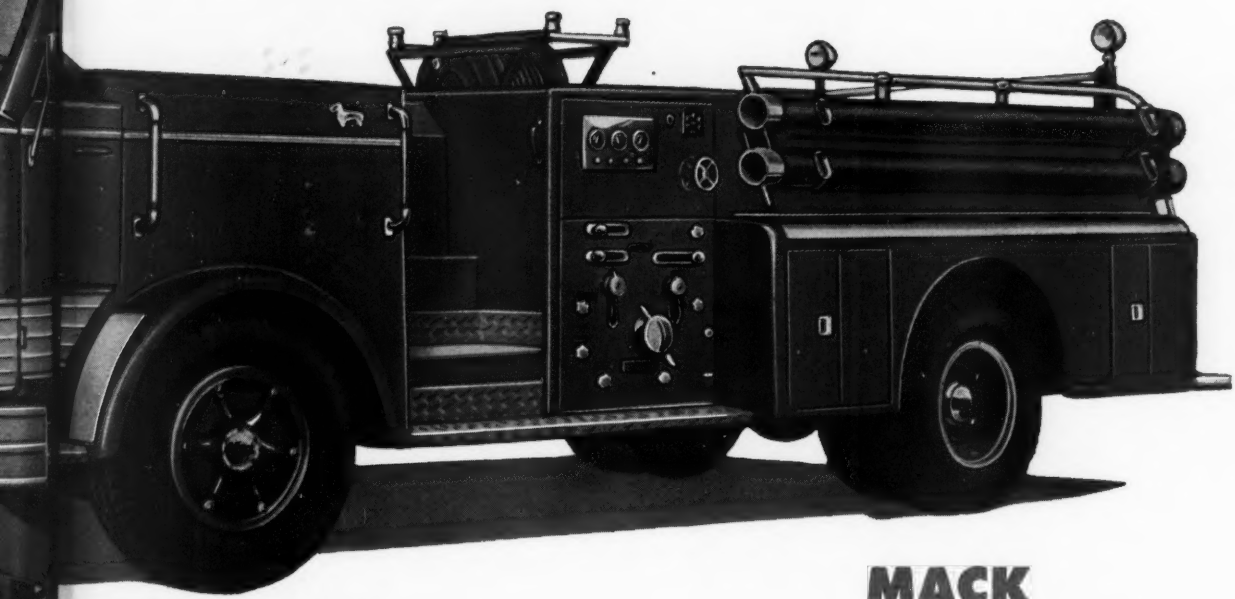
Behind the growing preference of major departments for Mack Fire Apparatus is a very simple fact: ***Mack dependability!***

You can depend on Mack custom engineering for apparatus that most exactly meets your operational conditions, regardless of terrain or climate.

You can depend on Mack custom construction because all critical components—cabs, engines, transmissions, frames, axles, bodies—are made by Mack to the very highest of fire-fighting standards. Mack controls this quality by manufacturing more of its own product than any other maker.

You can depend on Mack performance because, before any unit leaves the great new plant at Sidney, Ohio, every individual part of every major and minor component has been exhaustively tested for flawless functioning today . . . tomorrow . . . and in the years to come.

You can have the design you want—conventional or cab forward . . . standard or automatic shift . . . gear ratios for hills, for flat terrain, or for congested areas . . . clutches, air brakes and differentials that have no equal . . . and the incomparable Mack engines. Find out why Macks have earned the reputation: "When a Mack has to roll, it rolls—immediately. When a Mack has to pump, it pumps—indefinitely." Mack Fire Apparatus, Sidney, Ohio. In Canada: Mack Trucks of Canada, Ltd.



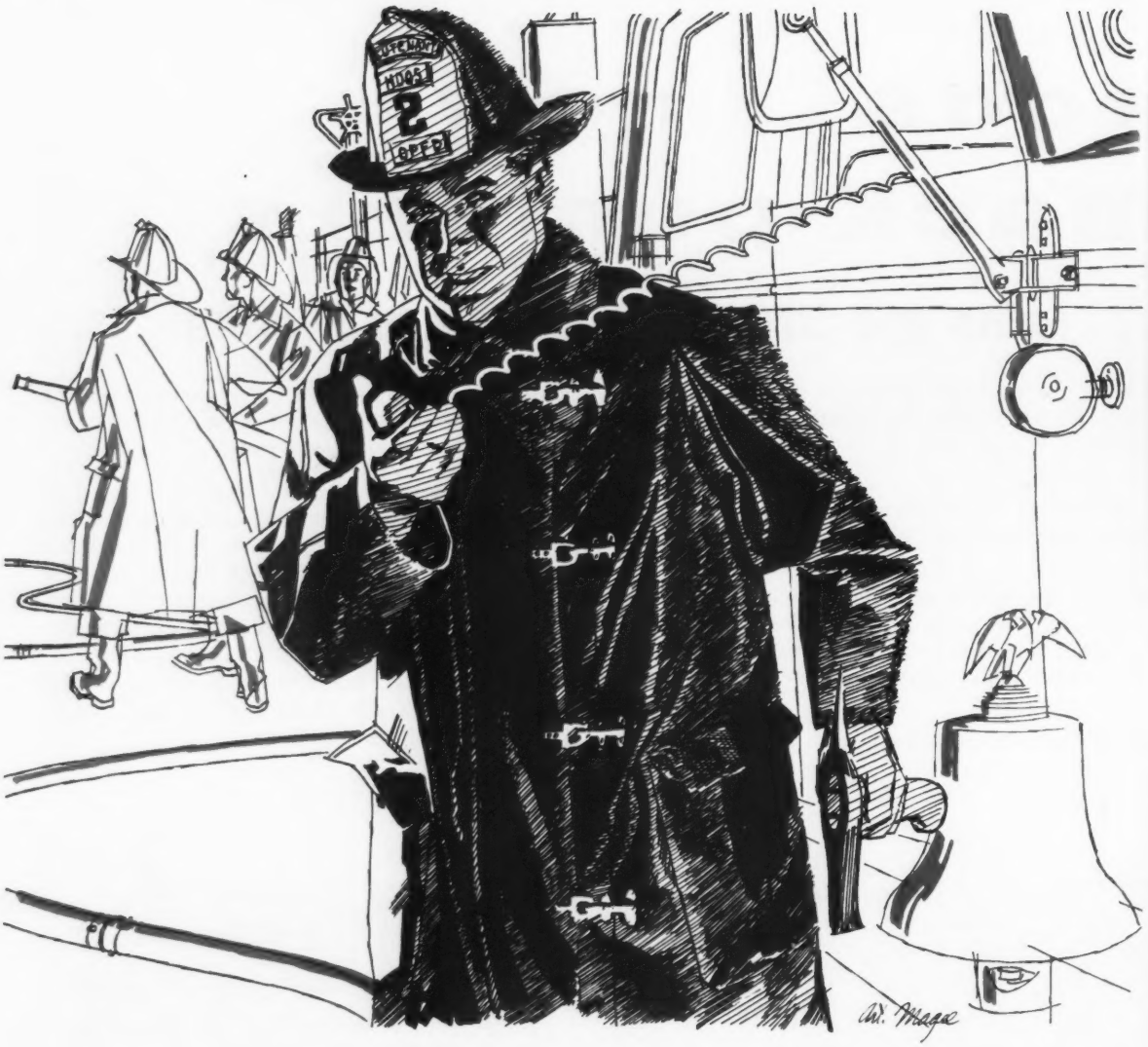
See one of Los Angeles' new Mack pumpers at the International Association of Fire Chiefs Convention in Los Angeles.

MACK

first name for

FIRE APPARATUS

COMPLETE LINE OF PUMPERS—500 to 1250 GPM . . . SQUAD AND HOSE WAGONS . . . AERIALS 65' to 100' . . . COMBINATION LADDER TRUCKS



"THERE'S NO SUBSTITUTE FOR THE BEST MEN

...OR THE FINEST RADIO EQUIPMENT

Maximum fire protection demands maximum effectiveness. Your firemen—dependable, able, and ready at a moment's notice—must have equipment of the same qualifications. Every one of the parts that go into your 2-way radio must be the finest available . . . must be guaranteed for long life . . . must keep the radio working in all emergencies. No wonder 3 out of 4 of the nation's radio-equipped fire departments depend upon Motorola 2-way radio and HANDIE-TALKIE® radiophone.

In New York, Miami, Los Angeles, Chicago . . . and practically every other leading city and countless large and small communities . . . rugged Motorola radio is proving that it is engineered to give the most dependable 2-way communications.

In your city or town, Motorola is ready to help you multiply your department's efficiency and protection. Learn how these benefits can be applied to your own operation.

® Handie-Talkie is a Registered Trademark of Motorola, Inc.

MOTOROLA 2-WAY FIRE RADIO

MOTOROLA COMMUNICATIONS & ELECTRONICS, INC. • A Subsidiary of Motorola, Inc. • 4501 Augusta Blvd. • Chicago 51, Illinois

Custom-Built to meet your needs

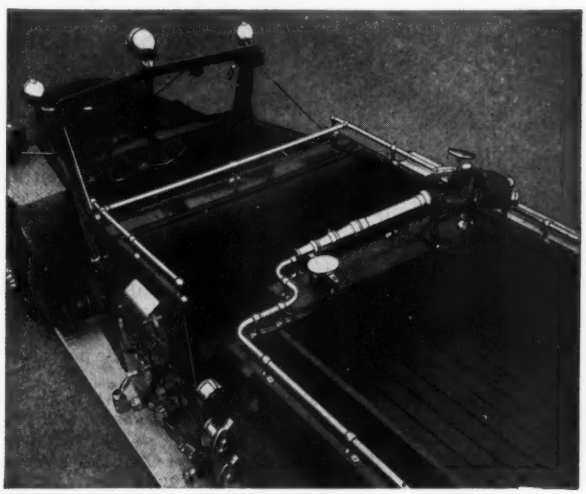
BASIC SPECIFICATIONS OF HOWE DEFENDER CHASSIS

ENGINE—6 cylinder Continental, Waukesha or Hall-Scott
IGNITION—Dual, with 2 spark plugs per cylinder
STEERING—Ross cam and lever
TRANSMISSION—Fuller 5-speed forward
PROPELLER SHAFT—Spicer oversized for F.D. service
FRONT AXLE—Timken I Beam
REAR AXLE—Timken full floating. Ratio specially engineered for service requirements
CLUTCH—Lipe-Rollway oversized for F.D. service
BRAKES—Service-hydraulic with booster on 4 wheels. Auxiliary mounted on propeller shaft back of pump
TIRES—9.00 x 20 duals rear

FIRE EQUIPMENT

PUMP—Waterous with famous split case for easy servicing
BOOSTER TANK—Capacity optional. Standard construction completely removable top, made of steel with highest percentage copper content available, coated with special zinc coating
HOSE BODY—Heavy gauge stretcher leveled steel. Chromed hand rails side and rear
COMPARTMENTS—Full width over pump and large tool box. Others to order
WARNING SIGNALS and LIGHTING EQUIPMENT—Flasher siren, 2 hoselights, 2 spotlights, 2 headlights, pump panel light, 2 hand lanterns
FIRE EQUIPMENT—Set of ladders, 2 extinguishers, pump suction hose and fittings, axe, crow bar, pike pole, hose reel, 150 ft. booster hose and nozzle
FINISH—F.D. Red Lacquer, Gold Leaf lettering and striping

WHEN you order new equipment, choose an experienced, old-line company building the latest and best apparatus on any chassis specified AND producing custom-built pumpers—the famous HOWE DEFENDERS! If you have a special problem, such as water supply, hilly terrain, serving of both city and suburban areas, a HOWE DEFENDER built to meet your individual needs is the answer. DEFENDERS are efficiently serving in such widely separated centers as Dallas, St. Louis, Fort Lauderdale, Muncie, Ind., Jamestown, N. Y. Let our engineers recommend the pumper to provide you with dependable, adaptable equipment.



The 5-man, semi-cab of Aiken's new HOWE DEFENDER is shown in close-up at right. Rear seat takes three men off the running board for important riding comfort and safety. This is a triple combination pumper with 240 HP Waukesha engine. Its auxiliary 100 gallon power take-off pump works while truck is rolling.

HOWE

Member FAM (Fire Apparatus Manufacturers Association)

HOWE

APPROVED BY THE
NATIONAL BOARD OF FIRE UNDERWRITERS

"dependable fire apparatus since 1872"

FIRE APPARATUS COMPANY

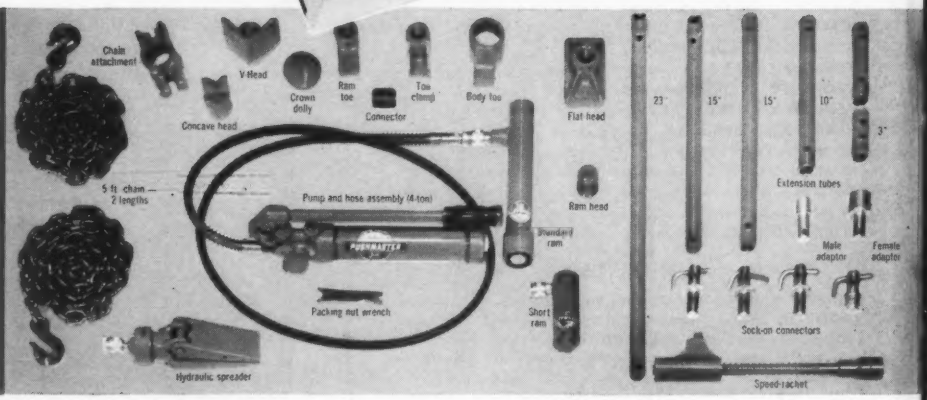
Dept. FE88, 1400 W. 22nd St., Anderson, Ind., U. S. A.

For the
FASTEST
Rescue Work!

TOOLS CLIPPED IN-PLACE

HEIN-WERNER

RESCUE KIT



Planned, engineered and built by the world's largest manufacturer of hydraulic jacks in co-operation with fire, police and safety authorities . . . Here is every tool you and your men will need for almost all rescue work in fires, traffic and industrial accidents . . . Tools clipped in-place instantly located. No jumbled parts to grope for when seconds count . . . Three handles on box for one and two-man carry . . . Ram extensions with quick couplers . . . Serrated bases on critical tools for firm anchorage . . . 4 TON CAPACITY.

DE LUXE KIT (shown above) contains the parts shown in panel. Price $129.95.

SENIOR KIT (not shown) contains all parts in De Luxe Kit except speed ratchet, short ram, chains and chain attachment. Price $99.65.

SPECIAL KIT (not shown) to meet Civil Defense specifications (CD VIII-156) to qualify for Federal matching funds for States and their political subdivisions under Standard Item Specification M6-1.

On next page is shown a rescue problem . . . Illustrated are two solutions: one with the Hein-Werner Rescue Kit; the other with older, method tools. *The information may be of value and interest to your men for both methods are accepted.* IF YOU WOULD LIKE REPRINTS TO POST ON STATION BULLETIN BOARDS—Use the coupon to tell us the quantity you want. No charge.

And use the coupon too, to order either of the KITS — DeLuxe or Senior.

Hein-Werner Corporation, Waukesha, Wisconsin

Gentlemen:

☐ Rush ..... (quantity) free reprints of the page "How would your men save these trapped people."

☐ Rush complete information on H-W Rescue Kits.

☐ Ship at once the DeLuxe Rescue Kit. Price $129.95.

☐ Ship at once the Senior Rescue Kit. Price $99.65.

Prices subject to change without notice.
Price includes cost of shipping in the U.S.A.

Name .....

Company or Dept. .....

Address .....

City ..... Zone ..... State .....

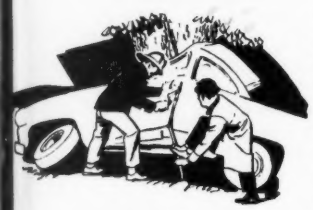
Enclosed (Check $.....) (M. O. $.....) (P. O. $.....)

HEIN-WERNER CORPORATION WAUKESHA, WISCONSIN

World's Largest Manufacturer of Hydraulic Jacks

HOW WOULD YOUR MEN SAVE THESE TRAPPED PEOPLE?

Note: wreck above was more accessible from other side for both methods of entry. Illustrations below were taken from photos of the driver's side of car.



CONVENTIONAL IMPROVISED TOOLS

(Left) Use hack saw and pry-bar. Best technique is considered to be: saw at window ledge downward while pry-bar is used near bottom of door.

Both methods partially spring door to offer purchase for two men to force opening by hand.

Pry-bar under rear of front seat breaks two holding bolts, but fulcrum at floor level is somewhat insecure.

Crow bar is used to break passenger seat bolts. Because of distance and interference from drive shaft housing in floor it is difficult, but given time, these tools will free the occupants.

HEIN-WERNER METHOD

(Right)Hydraulic Spreader starts jammed door, opens it far enough to accommodate ram extension.

Second ram extension now provides ample room.

Hydraulic Speader is now used to break 2 bolts holding seat which has jammed car driver against steering wheel. Vertical movement of wedge prevents further injury and occupant can now be removed. Same operation with hydraulic spreader frees passenger jammed against instrument panel. This is by far the fastest method.

HEIN-WERNER CORPORATION WAUKESHA, WISCONSIN

World's Largest Manufacturer of Hydraulic Jacks

ROCKWOOD
built-in proportioning systems for industrial and refinery fire trucks

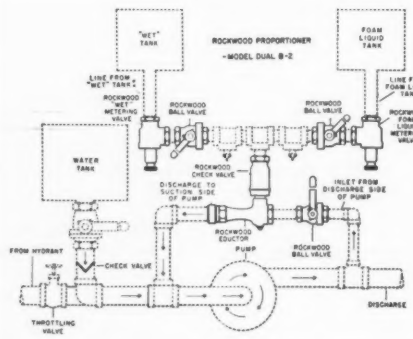
Rockwood-equipped refinery fire truck with Balanced FOAM Proportioning system utilizing ratio flow controller offering simultaneous FOAM and water application. Notice Rockwood's direct manual FogFOAM turret nozzle with single FOAM shaper and screen.

Rockwood's new Double Strength FOAM and Rockwood WET offer you many advantages

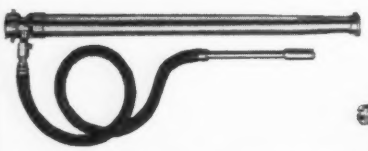
Double Strength FOAM has double foam-making capacity, cutting in half the transportation cost and storage space. It is faster spreading and flows freely — even at subzero temperatures. An outstanding FOAM liquid to go with Rockwood's advanced type of FogFOAM and FOAM Nozzle for quickly putting out fires in gasoline and other similar flammable liquids. Available in 5 gallon cans or 50 gallon drums.

Rockwood WET increases the spread and penetration of water into deep seated fires involving ordinary combustibles such as wood, paper, cloth, etc. It greatly reduces the water needed to extinguish such fires. Available in 50 gallon drums, 5 gallon and 1 gallon cans.

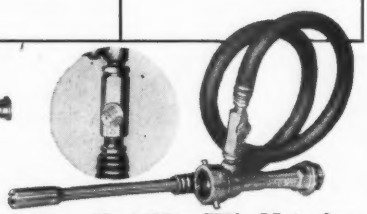
Regular FOAM and All Purpose FOAM are also available.



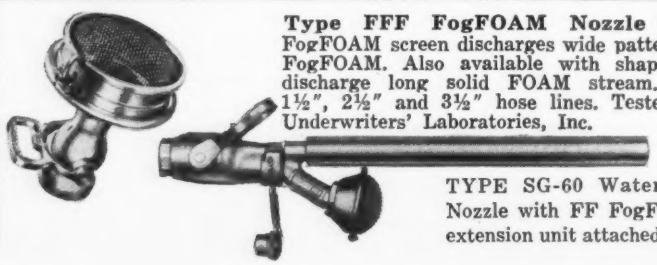
Proportioning System. Model B-2, around-the-pump proportioner. Used when pressure is maintained by pump. Custom-engineered systems are also available.



The F-501 Nozzle developed for use with 1½" hose to provide an economical means of applying a solid stream of FOAM on flammable liquid fires.



The Variable FW Metering-Check Valve with FW Eductor incorporates both the Metering Valve and Ball Check Valve in one unit and meters liquid into the hose line in any proportion from 1% through 6%.



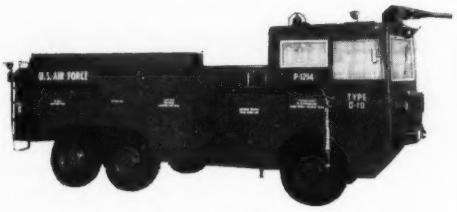
Type FFF FogFOAM Nozzle with FogFOAM screen discharges wide pattern of FogFOAM. Also available with shaper to discharge long solid FOAM stream. For 1½", 2½" and 3½" hose lines. Tested by Underwriters' Laboratories, Inc.

TYPE SG-60 WaterFOG Nozzle with FF FogFOAM extension unit attached

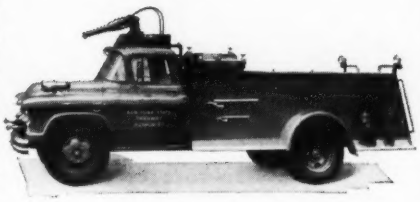
Rockwood offers you 4 types of turret control

...and any Rockwood turret gives you 4 types of discharge (1) FogFOAM, (2) Solid FOAM stream, (3) WaterFOG,(4) Solid water stream

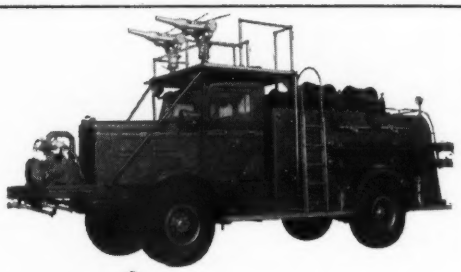
Remote Hydraulic Control Single Type FFF FogFOAM Turret Nozzle on Type 0-10 U. S. Air Force crash rescue fire fighting truck. Similar turrets can be supplied for oil refineries, chemical and industrial plants and municipalities. Hydraulically operated dual turrets also available.

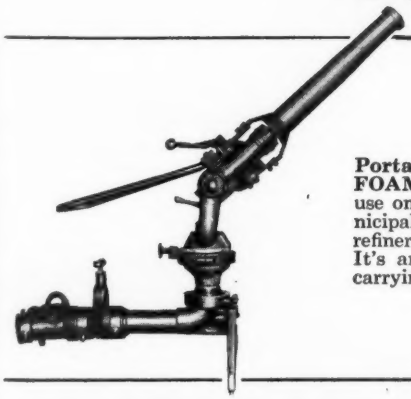


Remote Manual Control Turret Type FFF FogFOAM with two Ground Sweep Nozzles and two Hand Line Nozzles with FF Extensions, a Piercing Applicator and a Type D Proportioner for Rockwood FOAM and WET provide this New York State Thruway Authority truck with extra fire fighting equipment. The truck was built by Young Fire Equipment Corp., Buffalo, N. Y.



Direct Manual Control Dual Type FFF FogFOAM Turret Nozzles — can be operated directly by firemen from cab roof.

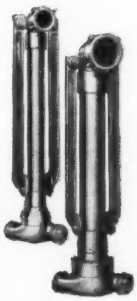




Portable Type FFF FogFOAM Turret Nozzle for use on fire hose lines by municipal fire departments, oil refineries and industrial plants. It's arranged for convenient carrying on fire trucks.

WaterFOG Equipment

Type SG-48 WaterFOG Nozzle. Easy to handle. Discharges high or low velocity WaterFOG or straight water stream.



Lightweight Rotating Cellar and Attic Pipe. Fights fires in cellars, attics, under piers, bridges, etc.

Type N22 WaterFOG Nozzle. Discharges high velocity WaterFOG. For general use around live electrical equipment.

Type N23 WaterFOG Nozzle with Swivel Handles. Discharges high velocity WaterFOG with higher discharge and greater range than Type N22 Nozzle.

ROCKWOOD

ROCKWOOD SPRINKLER COMPANY

Engineers Water . . . to Cut Fire Losses

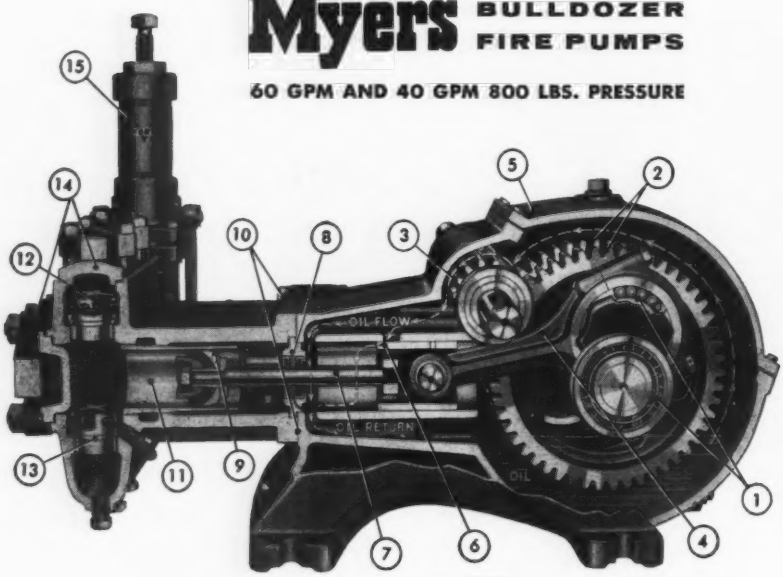
PORTABLE FIRE PROTECTION DIVISION

1242 Harlow Street, Worcester 5, Massachusetts
Distributors in all principal cities

Built by Myers for PRESSURE!

Myers BULLDOZER FIRE PUMPS

60 GPM AND 40 GPM 800 LBS. PRESSURE



See Numbered Cutaway Drawing

Manufacturers of fire-fighting equipment—and fire chiefs alike—specify Myers Giant Bulldozer fire pumps to deliver the dependable pressure required for vital high-velocity stream or cooling fog. Built by Myers and backed by nearly 80 years of pump engineering know-how, the Giant Bulldozer is designed to withstand the severe strain and hard service required of pumps operated under high pressures. Check these quality features one by one:

1. ROLLER BEARINGS—Throughout with hardened-steel wearing surfaces.

2. LARGE DOUBLE MAIN GEARS—Eliminate side thrust, strains, stresses and breakage. Friction, wear and loss of power are reduced to a minimum. Quiet, smooth, efficient and economical operation.

3. PINIONS—Flame-hardened steel, cut integral with the Shaft—no keys to wear or loosen.

4. CONNECTING LINKS—Extra long, move directly in line with the cylinders. Have oversize wrist pins with removable bronze bushings. Large roller bearings reduce friction and power loss to a minimum.

5. GEAR CASE—Dust, dirt and drip proof. Working parts removable without draining oil.

6. CROSSHEADS—Large diameter and extra long. Keep plungers centered in cylinders—cups wear evenly, last longer.

7. PISTON RODS—Stainless steel, accurately centered and securely fastened into crossheads.

8. WATER AND OIL SEALS—To prevent water from entering and oil from leaving gear or oil chamber.

9. PLUNGERS—Rubber and fabric cups—easily replaced at low cost.

10. WATER END—Flanged and bolted to gear case—no long bolts to stretch and loosen.

11. CYLINDERS—Heavy-steel shell with smooth, wear-resisting, non-corroding, porcelain lining. Patented. Tapered fit—no packing required. Easily removed and replaced.

12. FLAT VALVES—Patented. Spring loaded, disc type. Stainless steel disc, seat and spring. Fast and positive seating.

13. VALVE SEATS—Hardened stainless steel, tapered, no gaskets—less corrosion, less wear, more efficient.

14. VALVE AND CYLINDER CAPS—Have recessed gaskets and are held by bolted clamps. Can be quickly and easily removed.

15. PRESSURE REGULATOR—Diaphragm type. Fast, positive Flat Disc Valve.

CRANKSHAFT—Forged Steel Precision machined for extremely accurate tolerances. Heat treated and carefully balanced.

FREE

For complete details write for a free catalog section covering the full line of Myers fire pumps, high-pressure guns and fog nozzles. Send coupon to: The F. E. Myers & Bro. Co., Ashland, Ohio.

Name_____

Street_____

City_____

State_____

Myers® PUMPS

WATER SYSTEMS AND WATER SOFTENERS

THE F. E. MYERS & BRO. CO.

Ashland, Ohio • Kitchener, Canada

For a Well Balanced Fire Prevention Program

YOU NEED INDIAN FIRE PUMPS

Fire fighters call them a "ONE MAN FIRE DEPARTMENT"

Round out your equipment with an ample supply of **INDIANS**—"the pump of 100 uses." Here's what Fire Chief G. P. Lasher says about them:

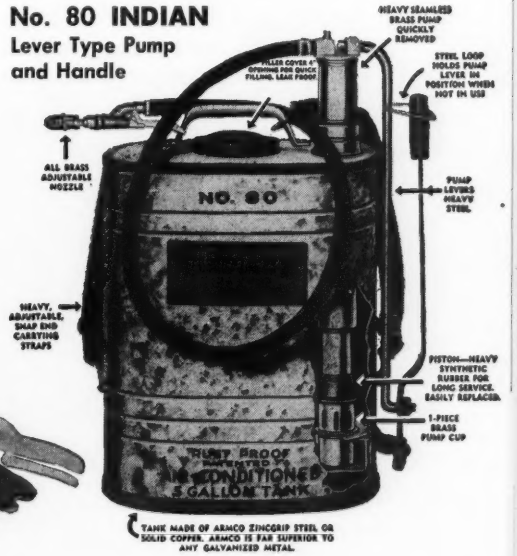
"I once thought **INDIAN FIRE PUMPS** had use only for putting out grass fires. Since buying a number of No. 90 solid brass tank **INDIANS**, however, and including them on our apparatus I found *the men would not use any other type of extinguisher*. We prefer them to any other hand extinguisher for *all Class A fires* and small oil fires."

No. 90 INDIAN
Sliding Pump Type

All seams of 5 gal. tank electric welded, no leakage. Curvature of tank fits back comfortably. Adjustable carrying straps. Pump throws 30 ft. pressure stream or nozzle switches for spray. Sturdily built for long service.

Both Types Approved by Underwriters' Laboratories, Inc.

No. 80 INDIAN
Lever Type Pump and Handle


HEAVY SEAMLESS BRASS PUMP QUICKLY REMOVED
STEEL LOOP HOLDS PUMP LEVER IN POSITION WHEN NOT IN USE
ALL BRASS ADJUSTABLE NOZZLE
NO. 80
PUMP LEVERS HEAVY STEEL
HEAVY, ADJUSTABLE, SNAP END CARRYING STRAPS
PISTON—HEAVY SYNTHETIC RUBBER FOR LONG SERVICE. EASILY REPLACED.
1-PIECE BRASS PUMP CUP
RUST PROOF
5 GALLON TANK
TANK MADE OF ARMCO ZINCGRIP STEEL OR SOLID COPPER. ARMCO IS FAR SUPERIOR TO ANY GALVANIZED METAL

Send for Our New Catalog

D. B. SMITH & CO. "FOR SEVENTY YEARS THE LEADERS" **406 Main St., Utica 2, N. Y.**

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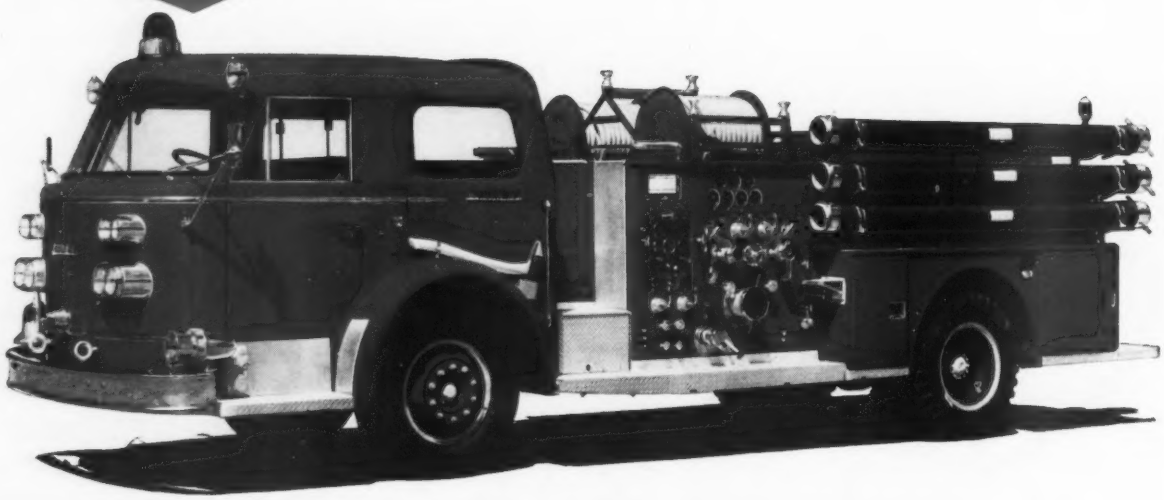
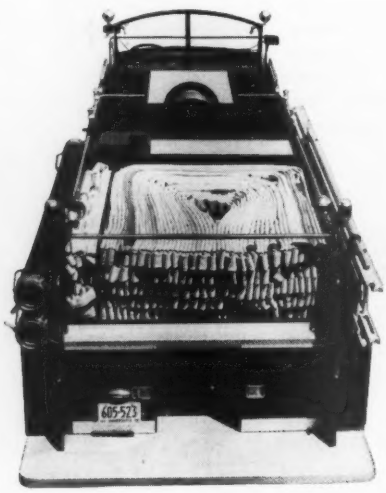
24 Important Improvements



In American LaFrance fire engines you get all of these improvements plus many other Extra Values that make American LaFrance the outstanding value for the fire service. Space permits only a partial listing of these new and important features. See our representative or write for complete data on the new 900 Series Fire Engines.

- New wider cab — It's 71 inches inside, 76 inches outside width.
- Wrap around windshield of safety plate glass is wider and 3 inches higher for improved driver visibility and protection.
- Increase in all seat widths — roomy seating for 5 men.

• **The driver's seat** is 4-way adjustable, 4 inches fore and aft and 3 inches up and down to provide proper seating for any driver. The gear shift lever is relocated, handy for driver with no passenger interference. The hand brake lever, too, has been relocated for greater driver convenience.



• **The 900 Series** hose body shown in the above photo is loaded with 2000 feet of 2½ inch dacron-cotton hose plus 450 feet of dacron-cotton 1½ inch hose.

in AMERICAN LAFRANCE

900 Series Fire Engines!

- Improved streamline appearance – hose body 4½ inches lower for easier hose loading and removal.
- Dual twin seal beam headlights for greater illumination and safety for night driving.
- Two red warning lights plus two amber directional signal lights at front.
- New chrome-manganese chassis springs for easy riding without roll on sharp turns or bounce on rough surface streets or roads.
- New chassis frame design with 10½ inch deep side members and one inch deeper cross member. Frame is rugged all welded construction for maximum strength and stiffness.
- Torque converter available in all models with any of 8 engines. No gear shifting, no clutch pedal, less maintenance.
- New 300 b.h.p. V-8 engine is added to wide range of power available to meet every fire service requirement.
- Nine compartments. Seven fully enclosed for stowing all equipment requiring weather protection. One of these compartments is ample size for 2-way radio.

In addition to these features and many more, there are Extra Value features in the Cab-Ahead-of-Engine such as short turning radius, (25 ft.). Shock absorbers both front and rear for a safer ride. Only American LaFrance offers all these features.

AMERICAN LAFRANCE CORPORATION

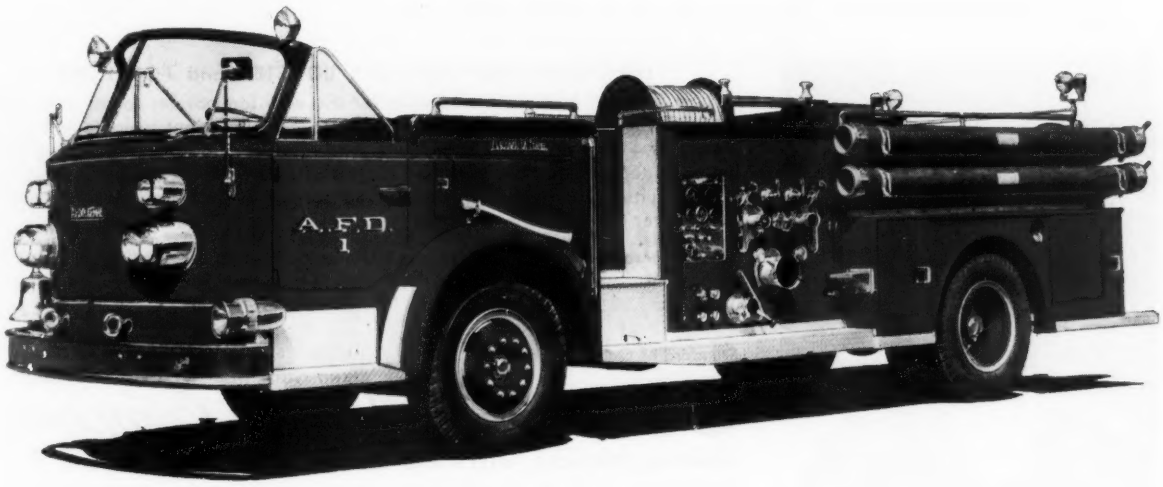
DIVISION OF STERLING PRECISION CORPORATION

ELMIRA, NEW YORK, U. S. A.

LAFRANCE FIRE ENGINE—FOAMITE LIMITED

TORONTO, 9, ONTARIO, CANADA

- See the new 900 Series Fire Engine at the I.A.F.C. Conference in Los Angeles.



COMPARE IT

For Compactness, Strength and Ease of Handling!

GOODALL "EZ flex"

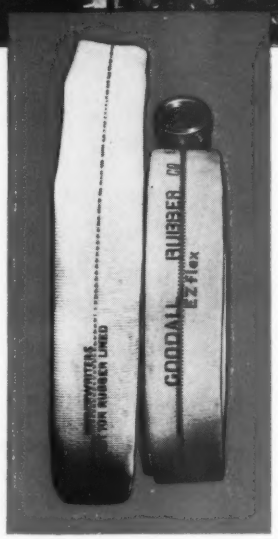
THE *Modern* FIRE HOSE

Stronger! Lighter! Longer Lengths!

Acclaimed as the most important development in fire hose construction in over half a century, "EZflex" is proving its sensational advantages in fire departments throughout the country.

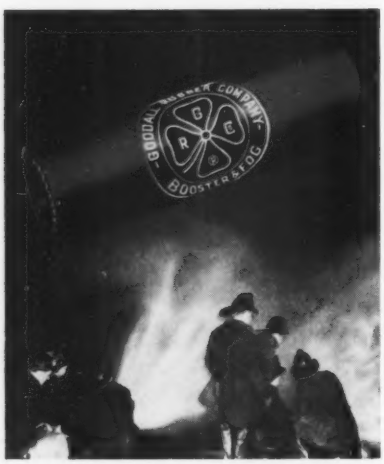
JACKET—A combination of high-tensile fibres of outstanding strength, woven by a special process, assuring highest resistance to pressure, wear, weather and rough handling. Size-for-size, "EZflex" pressure-resistance is equal or superior to the heavier and stiffer conventional cotton jackets, despite its much lighter weight. The tightly woven fabric is virtually snagproof, and is treated to resist mildew.

LINING—A light-weight yet long-wearing reinforced rubber lining, bonded firmly to the surrounding jacket, and having a perfectly smooth waterway to insure a full, fast flow. In combination, the "EZflex" jacket and lining provide a fire hose far ahead of conventional types in strength, flexibility, durability, ease of handling, and economy. "EZflex" is available in continuous lengths of 100 feet, which means fewer couplings. Single Jacket, sizes 1½" to 2½". Double Jacket, sizes 1½" to 3".



COMPARE! A 50 ft. coil of standard Cotton Rubber Lined Fire Hose weighing 21 lbs., and a **100 ft.** coil of "EZflex" Fire Hose weighing only **19 lbs.** What a difference in compactness and ease of handling!

UNDERWRITERS *and* FACTORY MUTUAL APPROVED FM



"LONG-LIFE" HIGH PRESSURE BOOSTER and FOG HOSE

A new Goodall hose built especially for use with fog nozzles to assure utmost strength and safety at working pressures to 800 lbs. Light weight—excellent flexibility—easy to handle in a hurry. Also ideal for booster service. Molded-and-braided construction; maximum lengths of 500 feet; ¾" and 1" I.D. Tough rubber tube; two rayon braid reinforced carcass in both sizes; wear-resistant red rubber cover.

Make a note to visit our booth—No. 92A—at the I.A.F.C. Convention in Los Angeles. "EZflex" and "Long-Life" will be there!

Standard of Quality—Since 1870

HOSE · BELTING · FOOTWEAR · CLOTHING
AND OTHER INDUSTRIAL RUBBER PRODUCTS

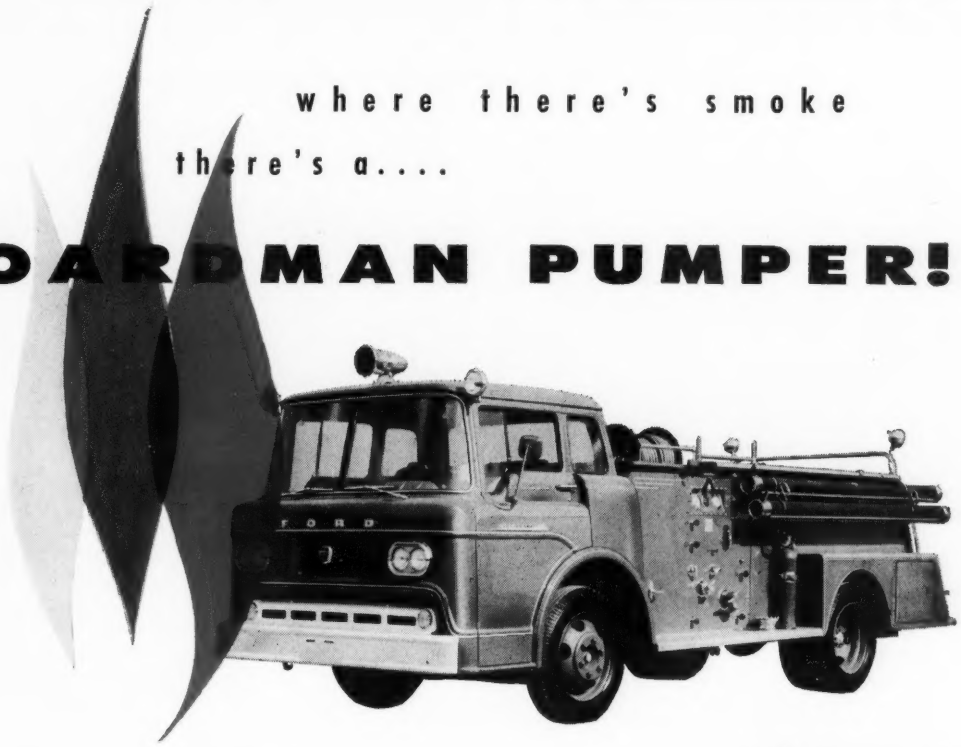
GOODALL *Rubber Company*

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

BRANCHES AND DISTRIBUTORS THROUGHOUT THE UNITED STATES.
IN CANADA: GOODALL RUBBER CO. OF CANADA LTD., TORONTO.

where there's smoke
there's a....

BOARDMAN PUMPER!

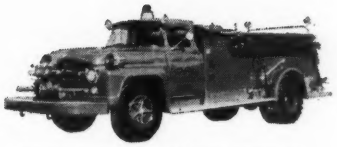


IN 180 AMERICAN COMMUNITIES, 250 Boardman pumpers, specifically engineered to local requirements, provide the most efficient and economical fire protection it's possible to buy!

A BOARDMAN PUMPER, designed exactly as you need it, can be mounted on the standard chassis of your choice — for which immediate, economical service is locally available!

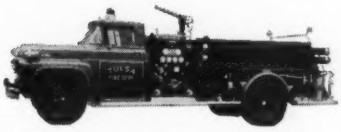
Equipped with dependable WATEROUS PUMPS, Boardman fire fighters assure added years of trouble-free service. Pump capacities range from 200 to 1,000 GPM!

WRITE TODAY for your copy of a new, illustrated brochure, *Boardman Fire Fighters . . .* and *when* there's smoke, CALL BOARDMAN! If your need is urgent, a collect call will bring immediate details.



Front mounted, 500 gpm pumper, 700 gal. tank, on Ford chassis.

500 gpm pump mounted amidships, 500 gal. tank, on GMC chassis.



750 gpm amidships pumper, 400 gal. tank and deck gun, Ford chassis.

BOARDMAN

THE BOARDMAN CO.

OKLAHOMA CITY, OKLAHOMA

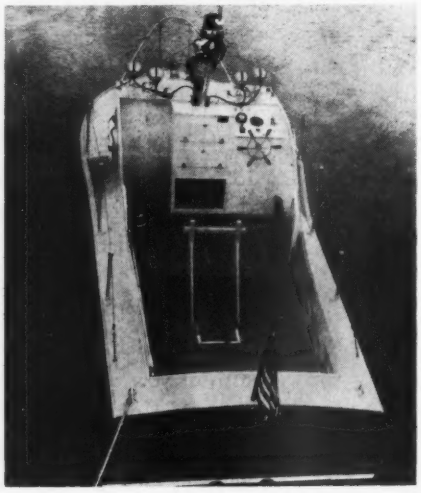
CLAYTON—FIRE—RESCUE—PATROL—BOAT

(Protection wherever it will float)

TWO MODELS: 26 foot and 34 foot

Rugged Lapstrake construction for low maintenance
Unrivaled Seaworthiness, Maneuverability, Speed
Fiberglass covered Decks and Floors
Monel Gas and Water Tanks
Toilet, Sink, Hatch, two-Berths
Ample Storage and Locker Space for all Equipment
Electrically operated Anchor,—Remote Controlled.

(26′)	(34′)
225 H.P. Motor	450 H.P. Motors
1000 G.P.M. Pumping Cap.	2000 G.P.M. Pumping Cap.



FIRE	FIRST AID	PATROL
Fire Pump	Resuscitator	Two-Way Radio
Deck Gun w/fog head	First Aid Kit	Public Address System
Foam Equipment	Blankets	Red Warning Light
Fog Nozzles w/applicator	Grappling Hooks	100 Amp Alternator
2½", Dacron Fire Hose	Hydro-Pak	1200 watt capacity
1½", Dacron Fire Hose	Stretcher	Floodlights
Axe, wrecking bar, spanners	Splints	Spotlights
CO_2 Fire Extinguisher	Life Raft	Siren
Dry Chemical Fire Exting.	Life Rings	Handlights.

Write for complete details:

Clayton Skiffs, Inc.
Fischer Blvd.,
Toms River, N. J.

Richard M. Parkhurst
510 Madison Ave.,
Dunellen, N. J.

PROJECT YOUR COMMANDS

...like a Harpoon!

Now you can reach out with your voice . . . half-a-town or more . . . to deliver instant commands and instructions.

Simply point your Audio Hailer where you *need to be heard*—press the trigger and speak in a *normal* tone. Let the *instrument* do the work . . . *without* KILLING your voice!

New "TP" (transistor-powered) model uses *4* latest-type *power*-transistors (*not* portable radio types) . . . yet runs on standard flashlight cells! *More* power—*more* range—at negligible maintenance cost. Patented "anti-feed-back" design overcomes "howling"—in a compact, one-hand, 5¼ lb. unit. Costs far less than *any* type of portable voice equipment of similar power. TRY it yourself—mail coupon below.

AUDIO HAILER®

('TP') transistor-powered

PORTABLE MEGAPHONE

Midland (Penna.) Fire Department uses Audio ***Guider,*** mounted on fly-ladder of aerial —with standard ***Hailer*** on the ground— to create unique, low cost "two-way" voice system. Coupon brings details.

AUDIO EQUIPMENT CO., INC.
75 HARBOR ROAD, PORT WASHINGTON, NEW YORK

- ☐ Send brochure, with prices, on Audio Hailer.
- ☐ Send details of "two-way" aerial voice system.
- ☐ Have your local dealer make demonstration.

Fire Chief
(Or Safety Engineer) .....

Dept. (or Company).....

Town or City .....

Zone (if any).....State.....

INTERNATIONAL V-Line Models (as shown above) offer short-stroke V-8 engines of 401, 461 or 549 cu. in. displacement, with pumping capacities up to 1,250 GPM. You get higher road speeds on the way, more usable power at the fire. Positive-engagement starter and 12-volt ignition system assure fast starting every time. Choice of wheelbases and rear-axle-to-end-of-frame dimensions. GVW ratings from 25,000 to 33,000 lbs.

You'll find exactly what you want for your next fire truck in the complete International line of chassis and components!

INTERNATIONAL R-Line Models are available with high-torque six-cylinder engines of 372, 406, 450 or 501 cu. in. displacement. Five-speed transmissions are geared for fast, dependable performance—have power take-off openings on both sides. Axles, brakes, radiators and all other chassis components are specialized for your particular operating and pumping requirements. GVW ratings from 21,000 to 33,000 lbs.

INTERNATIONAL TRUCKS

INTERNATIONAL A-Line Models range from 18,000 to 25,500 lbs. GVW and are powered by six-cylinder engines of 264, 282 or 308 cu. in. displacement. Cabs are designed for safety and comfort. Brakes, springs and steering system are built for hard driving with a full equipment load.

For expert help in making your selections, see your INTERNATIONAL Dealer!

Take your Choice, Chief!

S cost least to own!

INTERNATIONAL HARVESTER COMPANY, CHICAGO
Motor Trucks • Crawler Tractors
Construction Equipment • McCormick®
Farm Equipment and Farmall® Tractors

Fire-fighting vehicles which must keep on fighting call for . . .

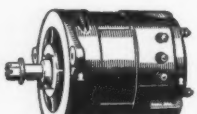
Delco-Remy Extra-Duty Electrical Equipment

to supply the extra electric power they need

In all kinds of weather and for hours on end, fire-fighting equipment must be able to stay on the job. *Dependable* and *ample* electric power is a must for the extra-heavy demands of floodlights, two-way radios and other special electrical units with which modern fire-fighting vehicles are equipped.

Delco-Remy extra-output a.c.-d.c. charging systems assure the extra electrical power needed in such service. Their special performance characteristics keep electrical accessories working at top efficiency. Delco-Remy extra-output generators with matching regulators protect batteries against excessive discharge and cycling effects. Batteries stay charged, and last longer.

Be sure to specify Delco-Remy extra-output electrical equipment, including the new longer life Delco batteries, on the new vehicles you order, and when you re-equip present ones. Both 6- and 12-volt a.c. application packages are available.



Model 1117103 is a Delco-Remy 12-volt a.c. generator widely used on fire-fighting vehicles. This dependable unit can provide up to 105 amps. under pumping conditions.

GENERAL MOTORS LEADS THE WAY—STARTING WITH

Delco-Remy

ELECTRICAL SYSTEMS

DELCO-REMY • DIVISION OF GENERAL MOTORS • ANDERSON, INDIANA

A "SURE-FIRE CURE"

that pays off in 3 situations—

1. **CALL REPORT**—GRASS AND BRUSH FIRE
   Snuffed out by driving around perimeter of fire with man on rear step operating 3XD from pumper tank. Fighting fire "on the move" saves time—conserves water.

2. **CALL REPORT**—FARM BUILDINGS
   Saved barn with water drawn from stream the pumper couldn't reach. Used 3XD as booster to pumper.

3. **CALL REPORT**—RESIDENCE
   Fire confined to one wing. Left 3XD to pump out basement and a good thing—had another call on arrival at station.

IF YOU GET a lot of calls like these, you'll find the 3XD Auxiliary Pump one of the most useful, valuable pieces of equipment money can buy.

FOR 3 COMMON types of fires, the 3XD will "speed the cure" by adding extra mobility, capacity and versatility to your operation — and at low cost.

FOR DETAILS, WRITE FOR 3XD BULLETIN 8120

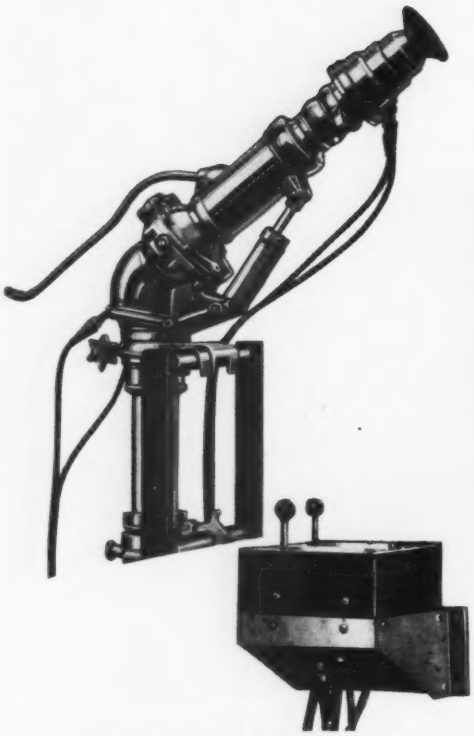
AMERICAN FIRE PUMP

Model 3XD

Used as mobile pump, booster, or to pump out basements. Supplies two 1½" hose lines with ½" nozzles, or one 2½" line with ¾" nozzle. Handles dirty water without serious damage.

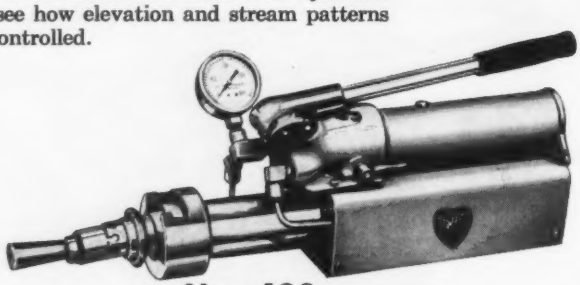
★ AMERICAN ★
FIRE PUMP COMPANY

P. O. Box 219-A, BATTLE CREEK, MICHIGAN, U. S. A.



ELK-VOGT REMOTE

This is Elkhart's hydraulic remote controlled ladder pipe. Actual demonstrations will be held in our booth and you will be given a chance to handle the levers yourself and see how elevation and stream patterns are controlled.



No. 422

HAN-DRAULIC EXPANDER

Be sure to see how easily Elkhart's new hydraulic expander attaches brass expansion rings. Demonstrations will be held in our booth. Note how segment change can be accomplished in a matter of seconds by slipping the patented mandrel and segment holder into one easy-to-fit slot in the power unit.

See

new

BOOTH 35

in

When you make the rounds at the show be sure to save enough time for an interesting visit at Booth 35. You are most welcome and we look forward to greeting you personally.

SO NEW WE'LL OPEN IT AT THE SHOW!

Greatest Nozzle Improvement in the last six years! When you visit Elkhart's interesting display be sure to ask about this newest development. Not only new, but will save you money too. DON"T MISS IT! First showing at the convention.

Elkhart's products

I.A.F.C.

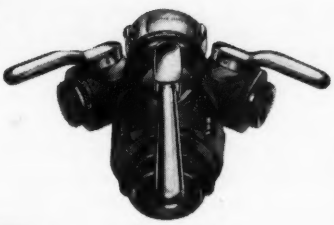
Los Angeles

Elkhart Brass has several new products that you will want to see . . . to ask about and be shown. What's more, we have a brand new product that won't be shown until the Show. See it, sure!

EASS

2½ Gallon STAINLESS STEEL ELK-AIR EXTINGUISHER

Be sure you see this latest improvement in the Elk-Air extinguisher line. Now offered with stainless steel shell and collar. The filler opening has been enlarged and the anti-overfill tube is now made of molded rubber to eliminate any corrosion at this point. Has improved valve. Lowered height permits use in 27″ cabinets. Brass gauge guard cannot be removed except with special tool. Plus other improvements we want to show you.



BG 104

WATER THIEF WITH BALL VALVES

We want you to notice the compact design of this new water thief and its lighter weight—only 21½ lbs. Features quarter turn ball valves with positive lock in open or closed position. Size: 2½″ inlet with two 1½″ and one 2½″ outlets. Body painted red with polished brass or chromium plated trim.

No. 468

T464

UNA-VEX SPANNER

This new pocket size spanner fits all 1½″ and 2½″ couplings and all sizes of gas cocks. Flat side of handle designed to fit Ansul Dri-Chemical caps. Available in malleable iron, brass or aluminum.

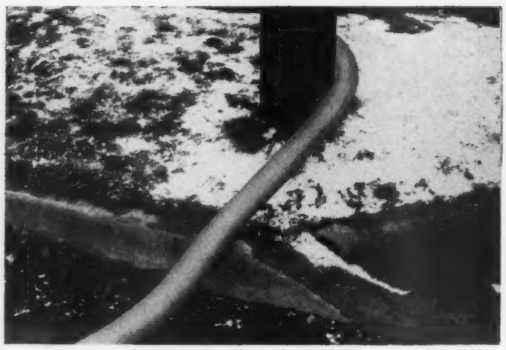
SPANNER

Please handle this new spanner when you visit the Elkhart booth. Note how it is designed to cut a small hole in plaster, tear off siding, cut a drain hole in floor, tear out window frames plus all the general features of a universal spanner. Available in malleable iron.

ELKHART BRASS MFG. CO., Inc., Elkhart, Indiana

More Than Half A Century Of Fire Fighting Progress

FLEXIBLE– Sure, Republic Fire Hose is flexible or no self-respecting fire department would use it . . . and lots of them use Republic Fire Hose exclusively.



DURABLE– High burst and resistance to pressure shock or water hammer. Strength of filler yarns gives this quality . . . no hose on the market has any better yarn in the jacket than Republic Fire Hose.

GOOD GRIP–You can grip and hold onto a rough surface much better than a smooth one. The rough texture of Republic Fire Hose inspires many firemen to identify Republic's as the "good gripping hose."

STORAGE SPACE–Curing shapes the hose. Republic's Flat-Cure permits easy handling, storing and coiling of more footage than any other shape.

GOOD FIRE HOSE!

Republic Rubber makes *good fire hose*...cotton or cotton and dacron jackets, rubber lined.

Everything about Republic's Fire Hose is special . . . the rubber (specially compounded); the yarn (specially selected); the weave (special design), to give the qualities of flexibility, water-tightness and durability. Below are the four grades of Municipal Fire Hose made by Republic Rubber. Order from Youngstown, Ohio, or any Republic District Office.

MILDEW-PROOFED

Provar treatment of cotton jackets is an exclusive process developed by Republic Rubber for the prevention of mildew and rot. The treatment is durable, will not wash out or lose its effectiveness. All four grades of Municipal Fire Hose made by Republic are supplied with Provar protection.

CHAMPION–Dacron filler, test pressure of 600 lbs. Best grade Fire Hose made.

TOWER – Dacron filler, test pressure of 400 lbs.

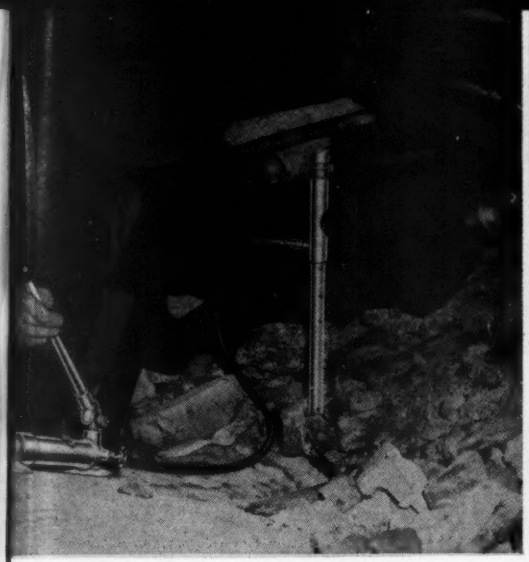
CHARIOT – Cotton yarn, test pressure of 400 lbs.

TARGET–Cotton yarn, made to meet demand for heavy-duty hose at moderate cost.

REPUBLIC RUBBER DIVISION

LEE RUBBER & TIRE CORPORATION, YOUNGSTOWN 1, OHIO

INDUSTRIAL RUBBER PRODUCTS



When seconds are critical . . .

save lives and property with

specially designed

Blackhawk Rescue Equipment

These time-proven hydraulic power tools spread, bend, push, press, lift and pull to instantly force entry . . . free trapped victims

At last there exists a full line of *hydraulic power tools* specifically selected and tested for all types of emergency rescue work!

This timely development can be credited to the many fire chiefs, sheriffs and other public and industrial safety experts who have proved the sensational efficiency of Blackhawk hydraulic "Porto-Power" for rescue purposes. Through the years, these men had been inspired to adapt "Porto-Power" to emergency rescue work because they had witnessed the miracle of power and flexibility performed by this equipment in other applications. Their urging and assistance have now led to the following:

Six "Rescue Kits" have been scientifically developed — in 4, 10 and 20-ton "power packages" — complete with "Porto-Power" remotely controlled hydraulic jacks and versatile attachments.

WHY IS THIS IMPORTANT? Think back to fires and accidents in your experiences . . . recall when victims were hopelessly trapped in wrecked vehicles or under debris. Think how rescuers struggled with hacksaws, prybars, torches, etc., sometimes losing the race against fire and death! Think how this modern, *fast* "Porto-Power" rescue equipment could have done the job in swift seconds instead of in agonizing long minutes or hours. Act today — learn how "Porto-Power" can help in your important role of protecting lives and property.

FOR A DEMONSTRATION — call your nearest Blackhawk representative. He's your local automotive, industrial or fire equipment distributor. Blackhawk Rescue Manual HR300 has been mailed to every fire chief. If you haven't received your personal copy, write us.

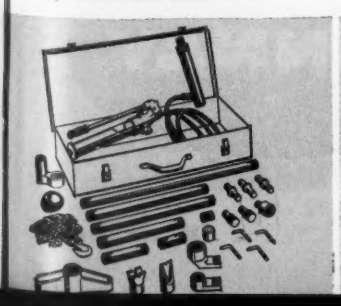
BLACKHAWK

Worlds largest manufacturer of HYDRAULIC TOOLS

BLACKHAWK MFG. CO., Dept. H-6488 • Milwaukee 46, Wisconsin

Visit our Booth No. 51, Fire Chief's Convention—September, 1958—Los Angeles

"Porto-Power" kits contain remotely-controlled hydraulic jack, spreaders and attachments.



Easy to set up, use! "Porto-Power" assembles in seconds. Hundreds of combinations.

Light, easy to carry. Take "Porto-Power" anywhere. Self-powered. Develops tons of force.

Works near gasoline and fumes. Eliminates sledging, etc., minimizes spark hazard.

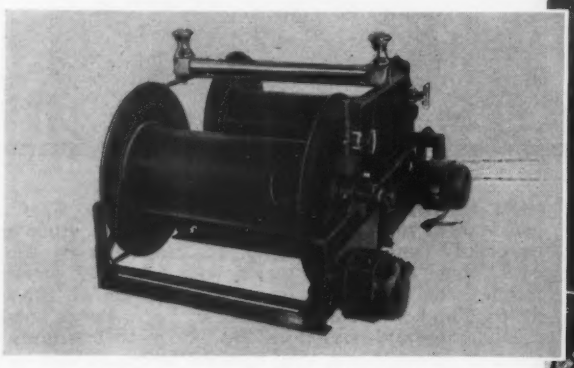
Proving Ground for HANNAY Hose Reels

HANNAY Reels outperform all others in daily use . . . the most rugged test of fire-fighting equipment!

Performance in actual use counts more than manufacturer's claims and test performance in fire-fighting equipment.

Over 25 years of dependable "in service" performance have made HANNAY reels first choice among firemen who demand the best equipment.

HANNAY quality is more than built-in, it's "designed-in." Specifications for design and performance are drawn by experienced, working firemen . . . your guarantee of superior performance when you *specify* Hose Reels by HANNAY.



These features make HANNAY HOSE REELS the *standard of quality* for fire-fighting equipment.

- **TRU-CIRCLE DRUM**
- **REINFORCING DRUM DISCS**
- **FULL-FLO HUB ASSEMBLY**
- **HEAVY DUTY EXPLOSION-PROOF MOTOR**
- **BALL BEARING SWING JOINT**
- **POSITIVE SPROCKET & CHAIN DRIVE**
- **HANNAY electric rewind conversion kits and chrome roller and spool assemblies are available for low cost modernization of existing equipment.**

Designed by Firemen for Firemen . . . . *Hose Reels by*

HANNAY®

For information about the complete Hannay line, stop in and visit us at the IAFC Convention, Booth 56 in the Los Angeles Shrine Exposition Hall.

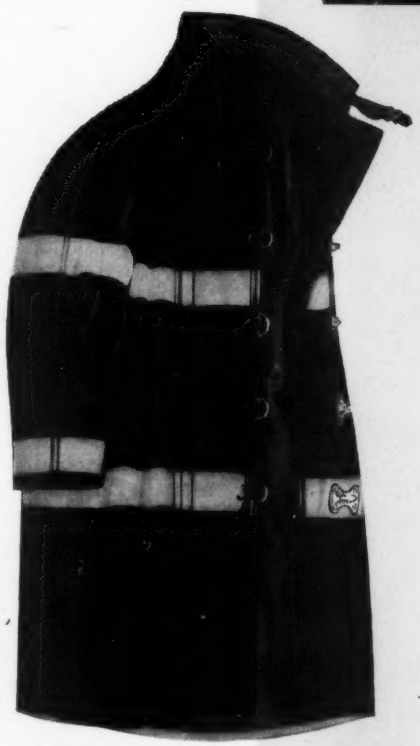
SUSTAINING MEMBER

CLIFFORD B. HANNAY & SON, INC., WESTERLO, N. Y.

MIDWESTERN

Safety Clothing for Firemen

The Original STRIPED SAFETY COAT



. . . was introduced 17 years ago and has been a leader ever since its introduction. There have been many imitations and substitutes offered but the ORIGINAL with the YELLOW stripes rubberized into the black rubber has stood the test against the makeshift models where the stripes are glued, sewed or painted on the material.

Protection, Comfort and Service are built into every detail of this coat. Many lives have been saved and accidents avoided in departments where the ORIGINAL MIDWESTERN SAFETY COAT is specified as standard equipment.

COLLAR — Close fitting around neck, up or down. Keeps out water and sparks. Rubberized outside, corduroy inside, cemented firmly so water can't lodge between. Adjustable strap fastener.

BODY — Only 2 pieces — one middle back seam.

SLEEVES — New style with vertical seams. Originated and designed by Midwestern for use in fire garments. Easy to get into fast. Won't tear out when carrying hose or other equipment on shoulder. Flexible, elastic inner sleeve for wrist.

STORM FLAP — 6-inch flap on front of coat keeps out cold and water.

SNAPS — 5 new Midwestern safety snaps.

SEAMS — All double stitched and cemented with layer of rubber cement. No water can penetrate through needle holes. Reinforced with rivets in all places subject to extra strain.

POCKETS — One extra large inside pocket, regular.

NONE GENUINE WITHOUT THIS TRADE MARK

COMBINATION SAFETY SUIT

The Midwestern Rubberized Coat and Bunker Pants make it easy for firemen to keep both warm and dry even in the most severe weather. Close fitting collar and elastic inner sleeve keep out sparks and water. Detachable wool lining. Pants have double-stitched seams, reinforcing rivets at points of strain, large roomy pocket space.

See your MIDWESTERN dealer or WRITE for Free Catalog and fabric samples

MIDWESTERN SAFETY MFG. CO., Mackinaw, Ill.

Located in the heart of the Peoria area manufacturing center

Manufacturers of the Famous MACKINAW Safety Coat

MIDSHIP PUMPERS ranging to 1000 GPM capacities . . . CRASH TRUCKS . . . TANKERS . . . with famous CHAMPION Pumps of 1-2-3-4 stages . . . available at proportionately low prices

MANUFACTURED BY

W. S. Darley & Co.

CHICAGO 12

If You Are In the Market for a NEW Truck It Will Pay You to Write Us

1908 DARLEY'S 50TH YEAR 1958

Powhatan

"SUPER-FORGE"

DROP FORGED BRASS COUPLINGS

LIGHTWEIGHT

NON-CORROSIVE

DURABLE

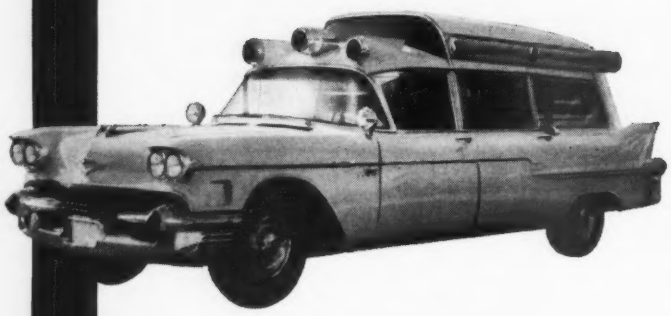
Three Lug *"SENSIBLE LUGS"*
on Male and Female with Higbee Indicators

Available in 1-1/2 and 2-1/2 inch sizes

POWHATAN BRASS & IRON WORKS
RANSON, WEST VIRGINIA
In The Same Location Since 1892

a place for everything
(and everybody)
in the completely new

S&S PROFESSIONAL CADILLAC AMBULANCE



Roomier, ruggeder than any other unit . . . engineered for professional rescue men!

That's the all-new S&S Professional Ambulance for 1958, with loads of exclusives no other ambulance can match. Big, "working room" interiors . . . 5-patient capacity. More equipment compartments than any other ambulance. 54" plus of inside headroom with full-opening (42" wide, 47" high) rear door. 5 Propello Ray lights. More oxygen equipment space. S&S high-strength box section steel construction.

Do yourself and your men a favor! Write today for complete specifications on the 1958 S&S Professional Ambulance . . . and the name of your nearby S&S distributor.

THE HESS & EISENHARDT COMPANY
Blue Ash Road, Cincinnati 42, Ohio

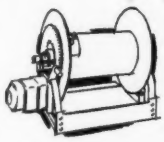
on land and on sea

you'll find

ardmore HOSE REELS

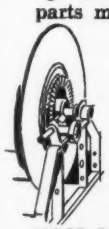
the choice for

dependable service



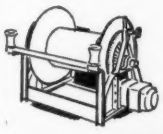
SMOOTH-SEAMED, PERFECTLY ROUND DRUM SURFACE protects hose from damage. Drums and discs made of extra heavy duty gauge steel.

SAFETY GEAR-TO-GEAR DRIVE Direct gear-to-gear drive. No linkage to cause "play" and extra parts maintenance.



COMBINATION BEARING AND SWING JOINT ASSEMBLY—guarantees perfect reel alignment and pressure-tight lines. Supplied for pressures up to 600 pounds and pressures above 600 pounds.

HOSE ROLLERS AND GUIDES For high speed hose take off and rewind from any angle. Prevents hose jumping over reel end . . . protects hose from damage.



● More and more you'll find Ardmore the choice for dependable service . . . particularly where performance must be certain no matter how severe the service condition. Every Ardmore Hose Reel is a quality piece of equipment, the best that better engineering, materials and manufacturing can provide. A good example of Ardmore engineering is the combination bearing and swing joint assembly that (1) results in superior reel support and alignment and (2) guarantees a pressure-tight connection at this critical point of the reel. Ardmore Reels are supplied in a complete choice of explosion proof, starter motor and hand-wind models. Your inquiry is cordially invited.

WRITE FOR FREE CATALOG

Let us send you our "Ardmore Fire Fighting Reels" catalog...gives complete information.

ARDMORE PRODUCTS

1827 SHERMER ROAD, NORTHBROOK, ILLINOIS

America's Fastest Growing Designers and Manufacturers of Engineered Hose Reels

Keeping Ahead with HIGH FOG

Two High Fog High Pressure Pumps provide Saranac, N.Y. Fire Department outstanding advantage of modern fire fighting methods.

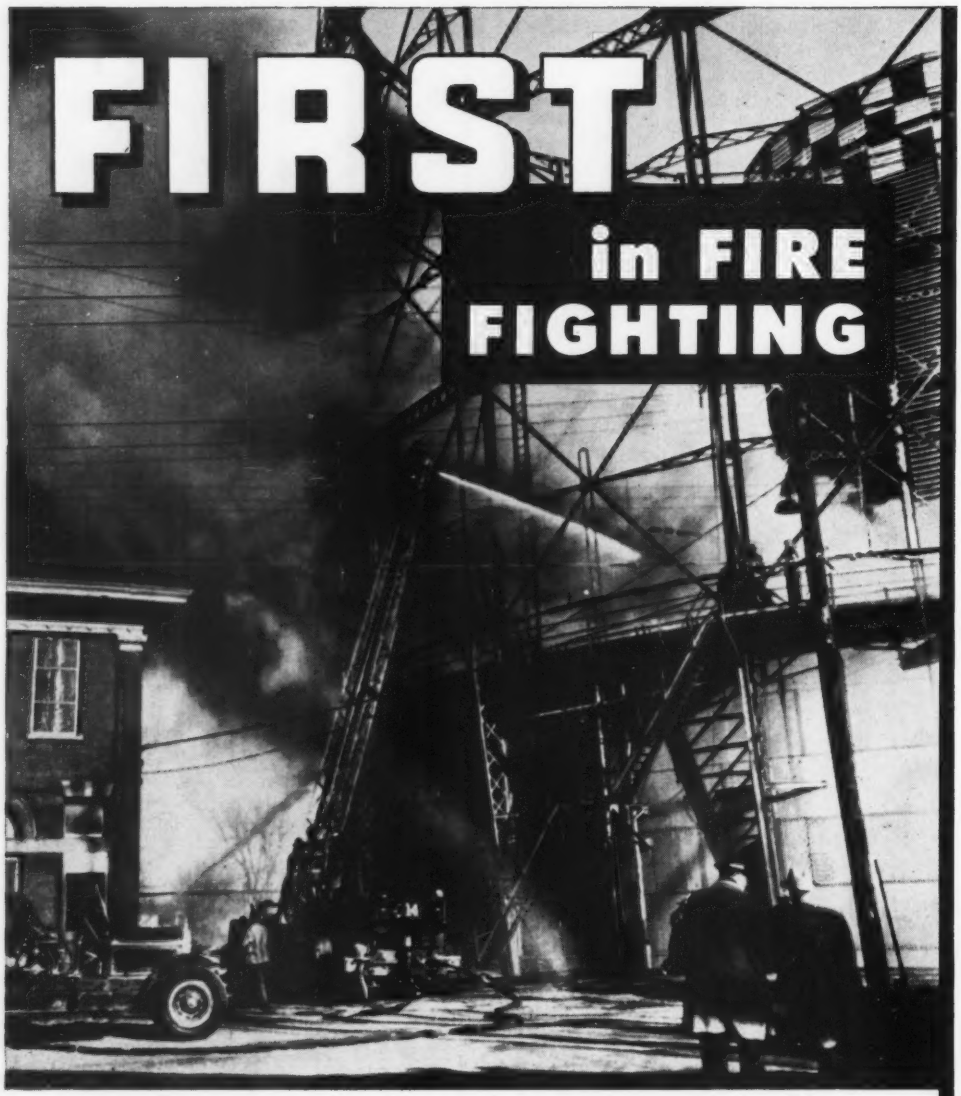
Quick protection is being given the wooded areas and frame farm buildings in this hilly Adirondack community by the Saranac Fire Department under Fire Commissioner John A. Coffey and Fire Chief Oscar MacDonald. The combination of two High Fog Pumps mounted on these new American Fire Apparatus trucks provides complete fire fighting units that have the added advantage of in-motion pumping.

More and more Fire Departments — both large and small — are adding the efficient versatility of High Fog Pumps. Capable of pressures in excess of 1000 psi, High Fog Centrifugal Pumps are inexpensive and easily installed. Specify them by name for either new or existing equipment. Write for complete information and specifications.

HF *high fog pump* COMPANY

225 Rosemead Blvd., Pasadena, California

CARPENTER "PORTALITES"
with RECHARGEABLE BATTERIES
FOR MODERATE TO FREQUENT USE
★ SAVE YOU MONEY
Elimination of dry battery replacements pay off initial cost-differential in 50-75 hours of use.
★ ASSURE FULL POWER
Spare battery may be inserted in 10 seconds! A Carpenter exclusive.
TYPE WS-6 (Illustration above left)
Choice of mile-range searchlight or brilliant worklight. One charge of battery gives 24 continuous hours service as worklight . . . 6 to 8 as searchlight . . . much longer if used intermittently. Only 12 lbs. including battery. Convenient finger-tip, self-balancing handle. Duro-satin finish.
TYPE SUPER-6 (Illustration at right)
Same fine basic unit with one-piece handle and housing.
SPECIFICATIONS & PRICES available upon request. Write today for full details.
A Light for Every Emergency Need . . .
For nearly half a century, Carpenter-Lights have been first choice of fire and police departments, of utility companies, of industry. When you need beacons, portable lights, spotlights, or stand-by emergency lights . . . You need Carpenter-Lights.
Complete catalog on request.
CARPENTER
MANUFACTURING COMPANY
202 Bradley Street • Somerville 45, Mass.



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FWD

Fire Master Corp.

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UNIVERSAL

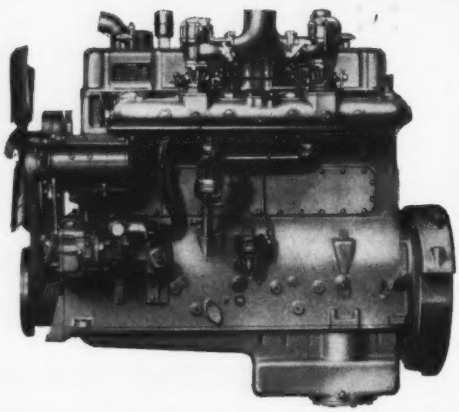
THE GENERAL FIRE TRUCK CORP.

MAXIM MOTOR COMPANY MAXIM MIDDLEBORO, MASS.

HF HOWE

Model 145-GZB—300 hp range High-Output Fire Fighter—

Six cylinders, 5⅜-in. bore x 6-in. stroke, 817 cu. in. displ., with counterbalanced and vibration dampened 3½-in. 7-bearing crankshaft; dual downdraft carburetion; dual ignition; precision extra high capacity bearings; removable wet type cylinder sleeves, aluminum pistons, overhead valves with Stellite-faced exhaust valves and seats. Arranged for full electrical equipment and all modern accessories. Get Bulletin 1662.



390 *Waukesha Motor Company, Waukesha, Wis., New York, Tulsa, Los Angeles*

WAUKESHA *FIRE FIGHTER* ENGINES

RCA RADIO...FIRST CHOICE OF THE LEADERS

NOW...A 2-Way "Belt" Radio ...for constant control at the fire grounds!

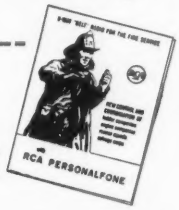
Your entire fire-fighting and service personnel can be under continuous control with RCA Personalfone. Worn on the belt, this miniature transistorized battery radio provides instant 2-way communications for rescue squads, ladder companies, hose men and salvage corps in buildings. RCA Personalfone assures the same communications mobility and control that RCA Carfone Radio gives to vehicles.

Personalfone's small, lightweight transmitter and receiver are contained in two leather pouches. Comes equipped with antenna, battery, microphone, speaker or earphone. Combines with RCA Carfone Radio for vehicles, assuring the quality communications of the leader in radio and electronics. Expert service by RCA's own radio technicians.

RCA Personalfone

2-WAY "BELT" RADIO

Find out about this modern communications equipment today! Free literature on request.



RCA Tmk(s) ®

RADIO CORPORATION of AMERICA
COMMUNICATIONS PRODUCTS
CAMDEN, N.J.

Radio Corporation of America
Communications Products
Dept. J-50, Building 15-1, Camden, N.J.
In Canada: RCA VICTOR Company Limited, Montreal

☐ Please send me illustrated brochure about RCA Personalfone "Belt" Radio for 2-Way Communications at the fire grounds.

NAME _____ TITLE _____
(PLEASE PRINT)
FIRE UNIT _____
ADDRESS _____ COUNTY _____
CITY _____ ZONE _____ STATE _____

Headquarters for Fire Department

BRASS GOODS

Fig. 164N
4½" swivel female x two 2½" male Gated Siamese. Quick opening, ⅛ turn valves.

Fig. 183
Made either Right Hand or Left Hand 2½" male x female, gate valve.

McINTIRE BRASS WORKS

Pioneers in Nozzle Manufacture
ORIGINATORS and sole Mfgs. of

INVINCIBLE NOZZLES

We invite figuring or bidding on all types of brass work

Fig. 156
"MORSE" SHUT-OFF NOZZLE AND PLAYPIPE COMBINATION

FIREBOAT TOWER NOZZLE

Operated by Remote Control

with full Tranverse Control

Figure 114-B — one of many — made by pioneers in nozzle manufacture.

AUTOMATIC-OPERATING SHUTTER AND SLIDING POLE

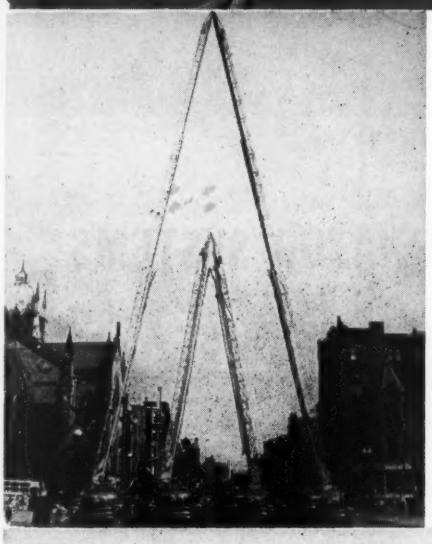
FIREBOAT BOW DECK GUN
15 feet high
6500 G.P.M.
5" tip.

For the FINEST BRASS GOODS *Specify* McINTIRE

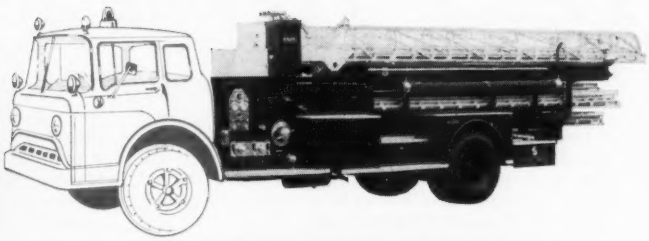
F. N. McINTIRE BRASS WORKS 377 Putnam Avenue Cambridge 39, Mass.

Now your choice of construction in SEAGRAVE Aerial Ladders

You select the chassis . . . It can be either a regular Seagrave or a commercial truck chassis . . . You select the Seagrave Aerial Ladder for the chassis . . . Seagrave gives you the choice of a specially designed aerial ladder for commercial chassis or the Standard Custom-Built Seagrave Ladder . . . Both of these ladders are ALL SEAGRAVE and have proven themselves by years of service in cities throughout the United States and Canada . . . Seagrave is the only fire apparatus manufacturer that gives you this choice of aerial ladders.



Seagrave Standard Custom Aerial Ladder built on a tilt-cab chassis will be on exhibition at the International Association of Fire Chiefs Convention.



The Seagrave Corporation, Columbus, Ohio
King-Seagrave Ltd., Woodstock, Ont.

MAIL THIS COUPON

SEAGRAVE— THE GREATEST NAME IN FIRE APPARATUS

THE SEAGRAVE CORPORATION,
Columbus 7, Ohio

Please send me complete information on the following:

☐ SEAGRAVE AERIAL LADDERS

☐ OR_____

USE THE ABOVE LINE FOR SPECIAL INFORMATION CONCERNING SEAGRAVE FIRE APPARATUS.

Name_____

Title_____

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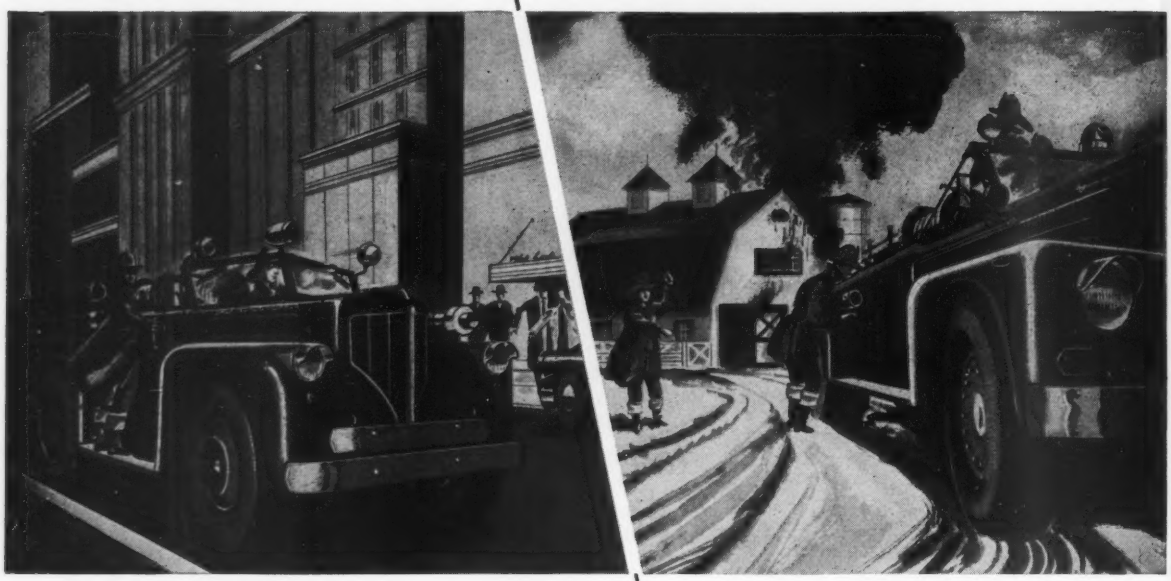
City_____ State_____

F.E. 8-58

for power to spare
on the way... at the fire...



Specify

Leece-Neville ALTERNATOR SYSTEMS

the best generator equipment you can buy!

Two-way radios, sirens, warning lights, rescue equipment—all combine to place a heavy load on your apparatus batteries. More of a load than the batteries can handle—*unless* you've installed Leece-Neville alternator systems!

Because they produce charging current *as soon as the engine starts*...enough to handle two-way radio transmitting loads...Leece-Neville alternators keep batteries charged . . . ready for fast, sure emergency starts in coldest weather!

And, high speeds can't damage L-N alternators ...they're designed for operation up to 12,000 rpm! What's more, L-N constant voltage level control assures peak radio performance . . . lengthens life of radio components.

Leece-Neville alternators, the original ac-dc generating system, have been used since 1946 as standard generating equipment on hundreds of fire apparatus fleets, both large city and rural volunteer departments. On any type of apparatus, large or small, L-N alternators will set new standards of performance while reducing operating and maintenance expense. For all the facts, see your local L-N distributor or write direct to The Leece-Neville Company, Cleveland 3, Ohio. *Distributors in principal cities . . . service stations everywhere.*

plenty of 110 volt power, too!

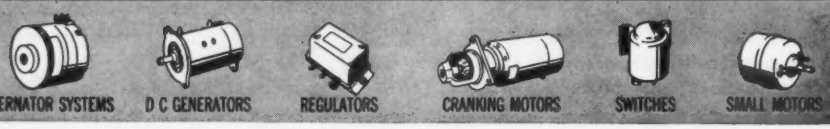
For abundant 110 volt power to operate floodlights, power tools, rescue equipment, etc., install a Leece-Neville 110 volt transformer and rectifier in conjunction with the alternator. Ask for special bulletin.

AA 6014

YOU CAN RELY ON Leece-Neville

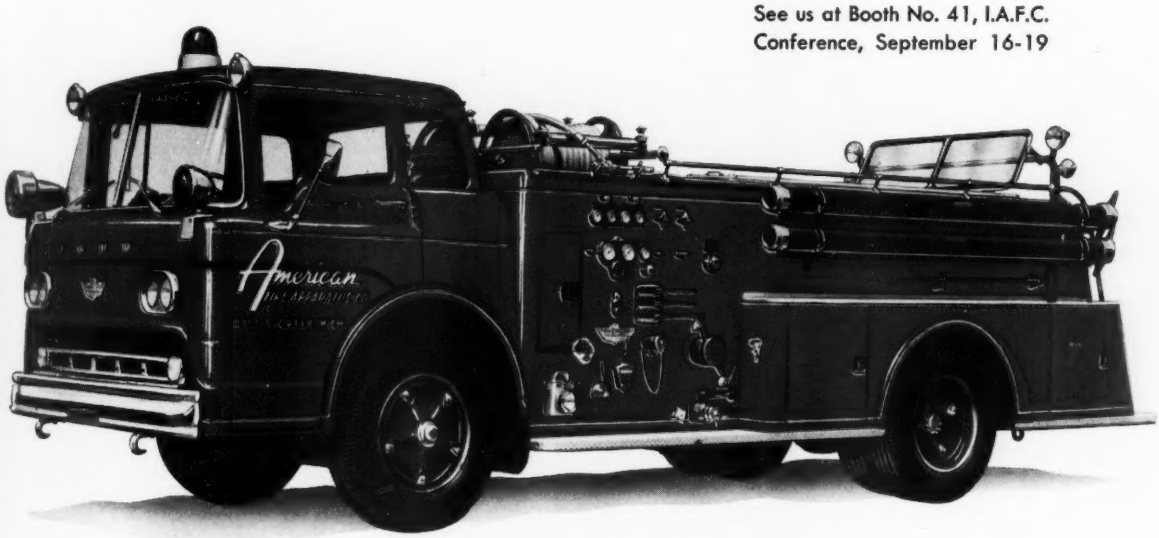
Automotive Electrical Equipment Since 1909

TRUCK • BUS • DIESEL • INDUSTRIAL • PASSENGER • RAILROAD • MARINE • OFF-HIGHWAY



Take a second look...

See us at Booth No. 41, I.A.F.C. Conference, September 16-19



Barton-American 4-stage, 750 GPM Pump entirely driven by main truck drive shaft.

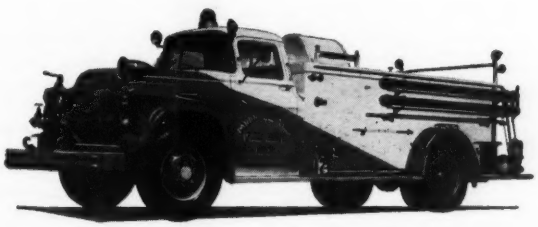
. . . see why owners *stay* satisfied with American Fire Apparatus

At the start, you get much more of what *you* want when you select American Fire Apparatus. That's because you can specify *more features* that suit your particular needs. Then, because we prize satisfied owners, we protect you with superior quality construction all the way!

For example, *our Barton-American Four-Stage Pump is the* only *make driven* entirely *through the truck's main drive shaft*—never *through the lighter-duty transmission p.t.o. This eliminates danger of an overloaded p.t.o. And it assures you of lasting ruggedness that is trouble-free.*

Take a second look *personally.* You'll see *many* better-engineered features —reasons why owners *stay satisfied* with American Fire Trucks. Ask our representative for proof!

Contact your nearest American representative for full details.



Equipped with famous Barton-American Front-Mounted Fire Pump.

AMERICAN FIRE APPARATUS CO.

American

FIRE APPARATUS CO.

"Always Pioneering with Added Engineering"

Main Office: Main Street Rd., Battle Creek, Mich. Plants at: BATTLE CREEK, MICH., MARSHALLTOWN, IA., STRATFORD, ONT.

CONGRATULATIONS

IAFC

The International Association of Fire Chiefs is to be commended for the splendid work it is doing toward the advancement of the Fire Service.

The Bi-Lateral Fire Hose Company says:

"Every Fire Chief should be a member of IAFC"

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37 Parkview Drive

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Jno. T. Hanway
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Universal Safety & Fire Equip. Co.
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WISCONSIN, MADISON
James A. Fenton
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BI-LATERAL'S DISTRIBUTORS AND DEALERS throughout the country join the Bi-Lateral Fire Hose Company in their full co-operation with INTERNATIONAL at all times.

BI-LATERAL FIRE HOSE CO.
20 NORTH WACKER DR.
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Sustaining member of IAFC
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Bi-Lateral Fire Hose, Kitchener, Ontario

SAFELY!

Equipment made of New Fabric Reflects 90% of Radiant Heat

How fast could you knock out a fire if you could move in really close . . . and stay there? Look at these men—they're in close and holding their ground. They're protected by equipment made of 3M Aluminized Fabric that bounces off intense heat.

An entirely new concept in heat protection is offered by flexible, long-wearing 3M Aluminized Fabric that reflects 90% of radiant heat. And it's 50% lighter than ordinary materials that only insulate against radiant heat.

Complete 3M Aluminized Fabric suits offer protection against 2000° F exposures to permit fire fighting and rescue operations never before possible under such conditions. Crash crews are able to penetrate the intense heat of burning aircraft for rescue work—*proof* of 3M Aluminized Fabric's reflective-protective qualities!

For safety's sake, see—test this amazing new material that is specified by military departments, used by modern city and industrial fire departments and rescue squads.

3M Aluminized Fabric is available in hoods, gloves, coats, full suits and salvage covers. Send coupon for free booklet "When It Takes More Than Courage".

3M BRAND ALUMINIZED FABRIC

Minnesota Mining and Manufacturing Co., Bldg. 42-5W, Room 514, St. Paul 6, Minnesota

Please send me booklet, "When It Takes More Than Courage".

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Address_____

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MINNESOTA MINING AND MANUFACTURING COMPANY
. . . WHERE RESEARCH IS THE KEY TO TOMORROW

"3M" is a registered trademark of Minnesota Mining and Manufacturing Company, St. Paul 6, Minn. General Export: 99 Park Avenue, New York 16, N.Y. In Canada: P. O. Box 757, London, Ontario.

NOW AVAILABLE . . . for the first time!

through your own selected apparatus builder

the HYDRA LADDER

A HYDRAULICALLY OPERATED JUNIOR AERIAL LADDER

Now, any town of any size, anywhere—can have an aerial TO FIT THEIR NEEDS! They can have it through their favorite nearby apparatus builder for this HYDRA-LADDER is being made available to ALL apparatus manufacturers. Built by the well known ALUMINUM LADDER COMPANY, original builders of aluminum ladders for the fire field. It has been designed for safety and hard fire service with cooperation of ALCOA.

Can be purchased as a pedestal for rear mounting on either new or old apparatus—or—a turntable mounting installed behind cab in conventional manner and utilizing hydraulic outriggers.

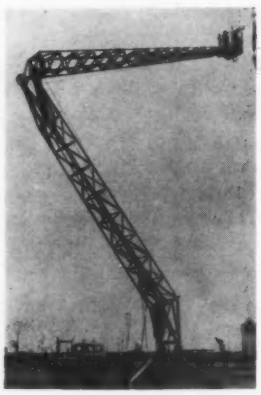
The HYDRA-LADDER will support and retract a load up to 200 lbs. in horizontal positional—meeting NFPA code #19. Available through any fire truck builder in USA or Canada.

55 or 65 feet with adjustable or non-adjustable outriggers . . .

•

complete information and demonstration on request.

•

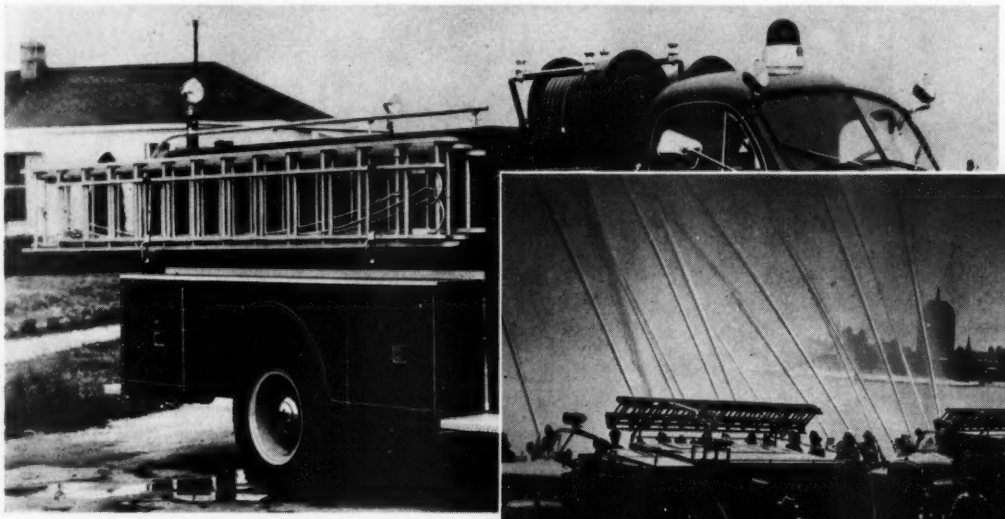


DEPENDABILITY AND SAFETY ASSURED . . .

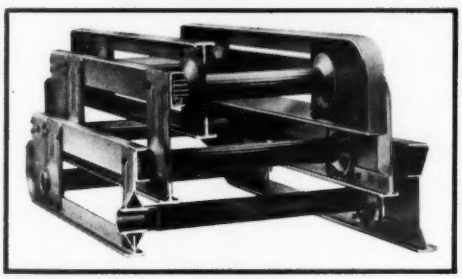
The hydraulic unit used on the HYDRA-LADDER is the same as has been used with thousands of ladders of all types for utilities, industrial plants, surface mining, etc. and is built and guaranteed by the well known Mobile Aerial Towers Company of Fort Wayne, Indiana. Unquestionably the finest, most widely used hydraulic lift available.

P. R. UDDSTROM CO.
VERNON, N. Y.

These versatile Pumpers are equipped with lightweight Alco-Lite Ground Ladders

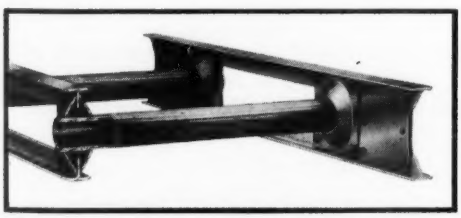


The Pumpers shown are products of Mack Trucks, Inc., Sidney, Ohio



Operate Automatically

Ladder sections extend — lock and unlock simultaneously. Spring loaded locks operate automatically. Channel slides the entire length of the ladder keep sections from becoming disengaged.



Permanent Rung-to-Rail Construction

Exclusive expansion bushing, rung to rail construction prevents rungs from twisting, turning, or breaking off.

They're lighter, easier to handle

The Alco-Lite Aluminum Ladders on the Mack Pumpers above feature open side rail, T-Channel design. All excess, weight adding bulk is eliminated. Only exclusive, Alco-Lite double gusset plate, expansion bushing construction makes this trim, modern design possible. These ladders more than meet any accepted tests for strength and safety.

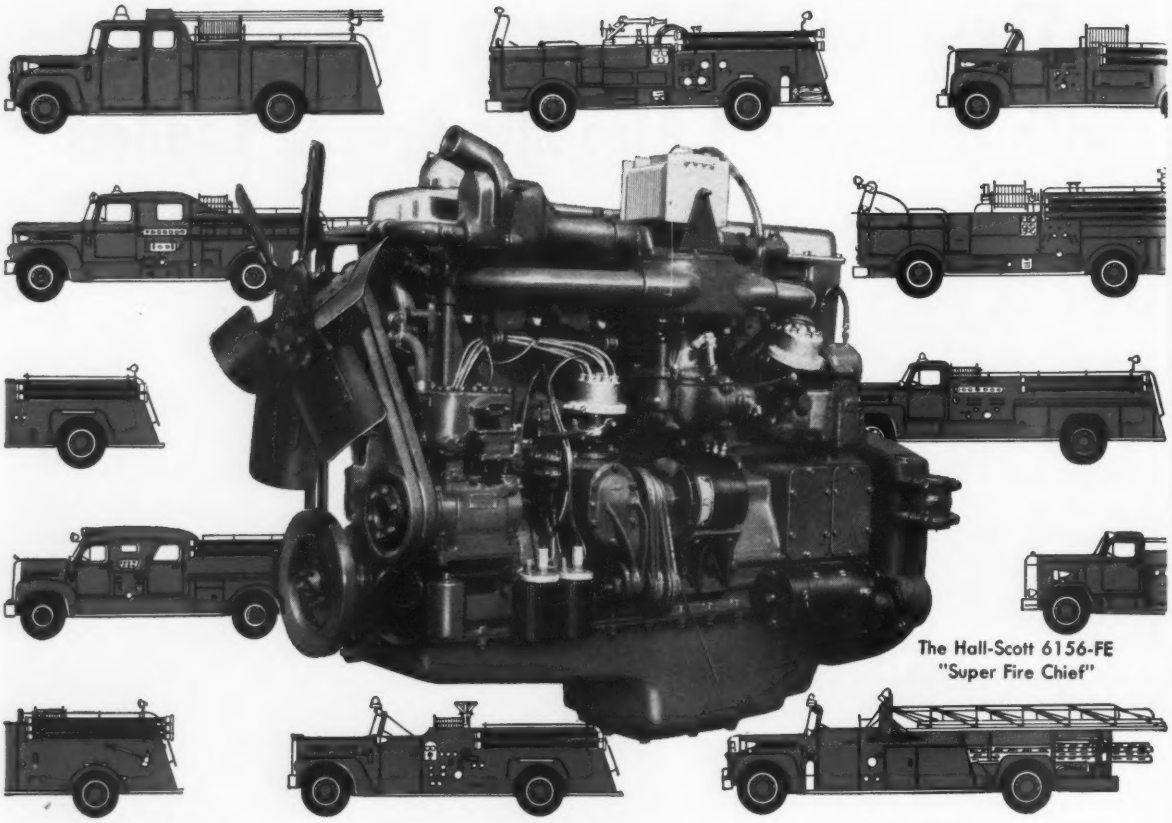
Maintenance is almost negligible with Alco-Lite Aluminum Ladders. They are not affected by water, moisture, fumes or gases. They will not warp, rot, splinter, or burn.

Because they are lightweight and trim, Alco-Lite Aluminum Ladders are easier to handle and easier to lift. They save precious minutes and require less physical effort when used at fires.

When you want easy to handle, safe, and almost maintenance free fire ladders, specify Alco-Lite Aluminum Ladders.

Aluminum Ladder Company ALCO-LITE

WORTHINGTON PENNSYLVANIA



The Hall-Scott 6156-FE
"Super Fire Chief"

For Fire Apparatus, One Engine Line Stands Out . . .

HALL-SCOTT

WELCOME TO LOS ANGELES, FIRE CHIEFS!

Your convention city has put 135 Hall-Scott engines into service in its fire-fighting equipment.

Hall-Scott engines have established a reputation with fire prevention officials nationwide. Noted for their dependability and power, Hall-Scott engines give users the plus value of simple and economical overhaul through overhead camshaft construction.

You can choose your Hall-Scott power from two great series of engines: the "Fire Chief," ranging from 150 to 250 HP; and the "Super Fire Chief," from 200 to 368 HP. All Hall-Scott engines for fire apparatus service are designed and built to meet the exacting specifications *you* have set for this vital service.

Get full details on the Hall-Scott engine best suited for the equipment you plan to buy—or repower. These fine engines are available in all principal makes of fire trucks.

HALL-SCOTT ENGINES are now being serviced and produced by Hercules Motors Corp. For repair parts, or consultation on new engines for your equipment, call on the Hercules Distributor near you.

HERCULES ENGINES . . . *Sold and Serviced the World Over*

HERCULES

HERCULES MOTORS CORPORATION
Canton, Ohio

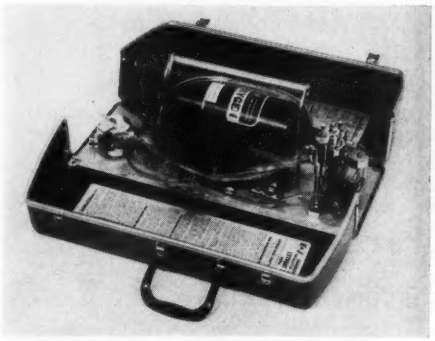
ANNOUNCING!

the new E & J LYTPORT II

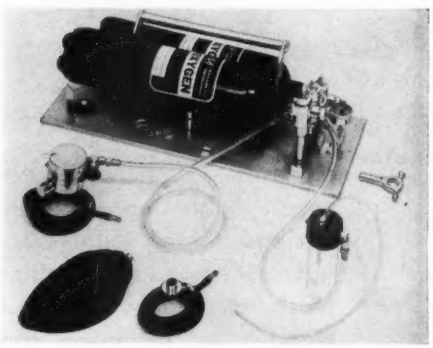
WEIGHS ONLY 28½ POUNDS COMPLETE

New design lightweight carrying case, with fast-action arrangement of famous E & J MICRO Resuscitator-Inhalator and Aspirator (over 9000 now in use).

a. easy to carry... only 28½ pounds complete. Rounded and smooth to protect legs.



b. case opens flat for normal operation... entire instrument plate lifts out easily, when needed, for use in tight spots, back pack carry, etc.



c. one cylinder carried for fast-in, early treatment, integral yoke and fold-down cradle for second cylinder if needed.

Lightweight molded fiberglass case ... sturdy, smooth, abrasion- and dent-resistant. Impervious to fresh or salt water, humidity, oil, grease, chemical sprays, etc.

Dimensions: 9½" wide, 10" high, 24" long. Priced low: $325.00*

*F.O.B. Factory, O_2 cylinders not included.

Please schedule free demonstration for me. Phone for date.

Name_____

Address_____

City_____ State_____

Phone No._____

E&J

For details or demonstration, mail coupon or contact your regular E & J Dealer or the E & J Factory.

MANUFACTURING COMPANY

100 East Graham Place • Burbank, Calif.

ARE YOU A BOBBER?

When wearing ACME MASKS you need a minimum of head movement in order to see the hazards in your way.

Don't judge a mask by looking at it—look through it.

COMPARE by *wearing* them all.

ACME gives the best vision upward, downward and sideward (every direction, actually.)

COMPARE the ease of fit—have all of your men compare one or all competitive masks and see what they say about comfortable seal.

COMPARE the tightness of fit—Acme doesn't have to resort to ridges or inward flaps to give a perfect seal. (Inward flaps are needed when you use a pressurized mask in high altitude, etc.)

COMPARE drainage—of sweat and saliva!

COMPARE head harnesses—Acme's is the only reinforced one.

COMPARE voice transmission—the enunciation is good; and enunciation, NOT noise, conveys your orders.

COMPARE costs—Fewer repairs make Acme the BEST BUY.

COMPARE with men who have used ACME Masks for a long time.

COMPARE Acme's Flat Lenses with all curved lenses for two reasons:

1) ***Minimum of optical distortion***
2) ***Makes possible a straight pull when the rim is tightened rather than tending to roll the rubber off the lens and put additional stress in the lens.***

COMPARE Acme's resistance in violent breathing. Acme's Patented Exhalation Valve design gives less restriction to outgoing airflows which are the ones that tire you most. (The diaphragm muscle used to pull air in doesn't tire—while rib and belly muscles used to blow air out do tire easily.)

COMPARE Acme Fog Clarification—Acme's Patented Jet Air Valves just under the lenses are the reason. Only if you could put this feature on competitors' masks would they be equal to Acme's Fog Clarification.

The only mask designed to be . . .

Interchangeable with any accessory equipment. It is available with SEE-O Indicator Window Canister, Hose Mask, air supply, etc. and is demanded by many on competitive equipment because . . .

The line between lenses is IMPORTANT* It makes possible FLAT lenses for undistorted vision. It can be folded inward to fit NARROW faces—or spread outward to fit WIDE faces. Pressure points are reduced by this feature.

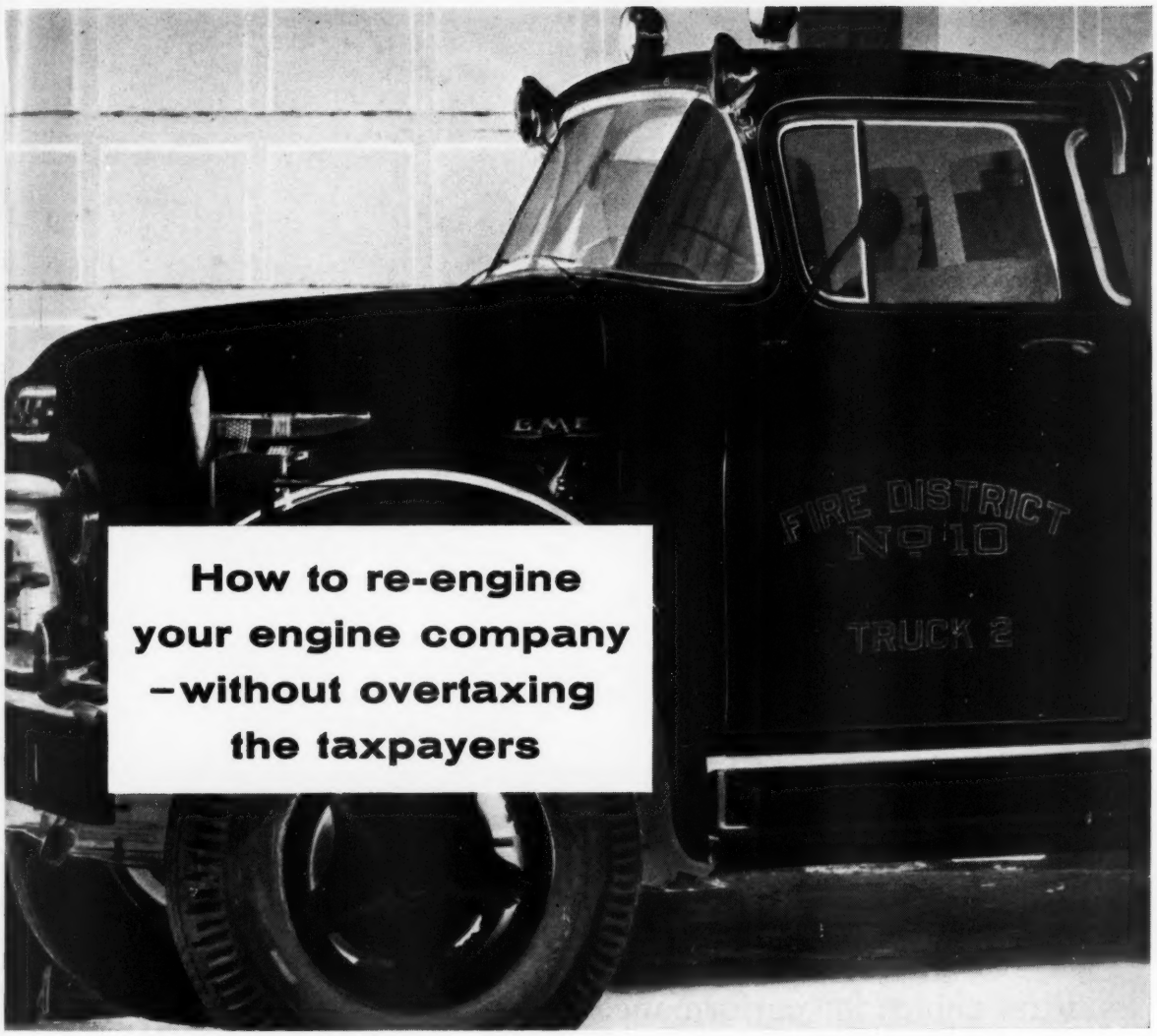
** For those who worry about the hinge blocking their vision:*
Just hold a pencil or your finger vertically in front of your nose and see how little it interferes with seeing across the street.

ACME IS BEST

ACME is the company that makes only GAS MASKS and their accessories.

ACME PROTECTION EQUIPMENT CO.

1215 Kalamazoo Street, South Haven, Michigan

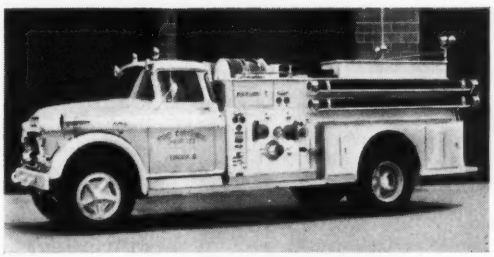


How to re-engine your engine company —without overtaxing the taxpayers

A brand-new, top-drawer piece of fire-fighting equipment costs far less than you'd imagine – when it's based on a fire engine chassis designed and built by GMC.

You can have most any type body or apparatus you wish. Installation—by the equipment-maker of your choice—is easy and relatively inexpensive.

With a GMC, you've got a *real* fire fighter! Its chassis is especially stressed to meet the rigors of emergency action. There's a choice of hustling V8 or six-cylinder power. There's hydraulic power steering for fast maneuvering. And you'll get 500 to 1000 gallons of water per minute in Class A pumper service.

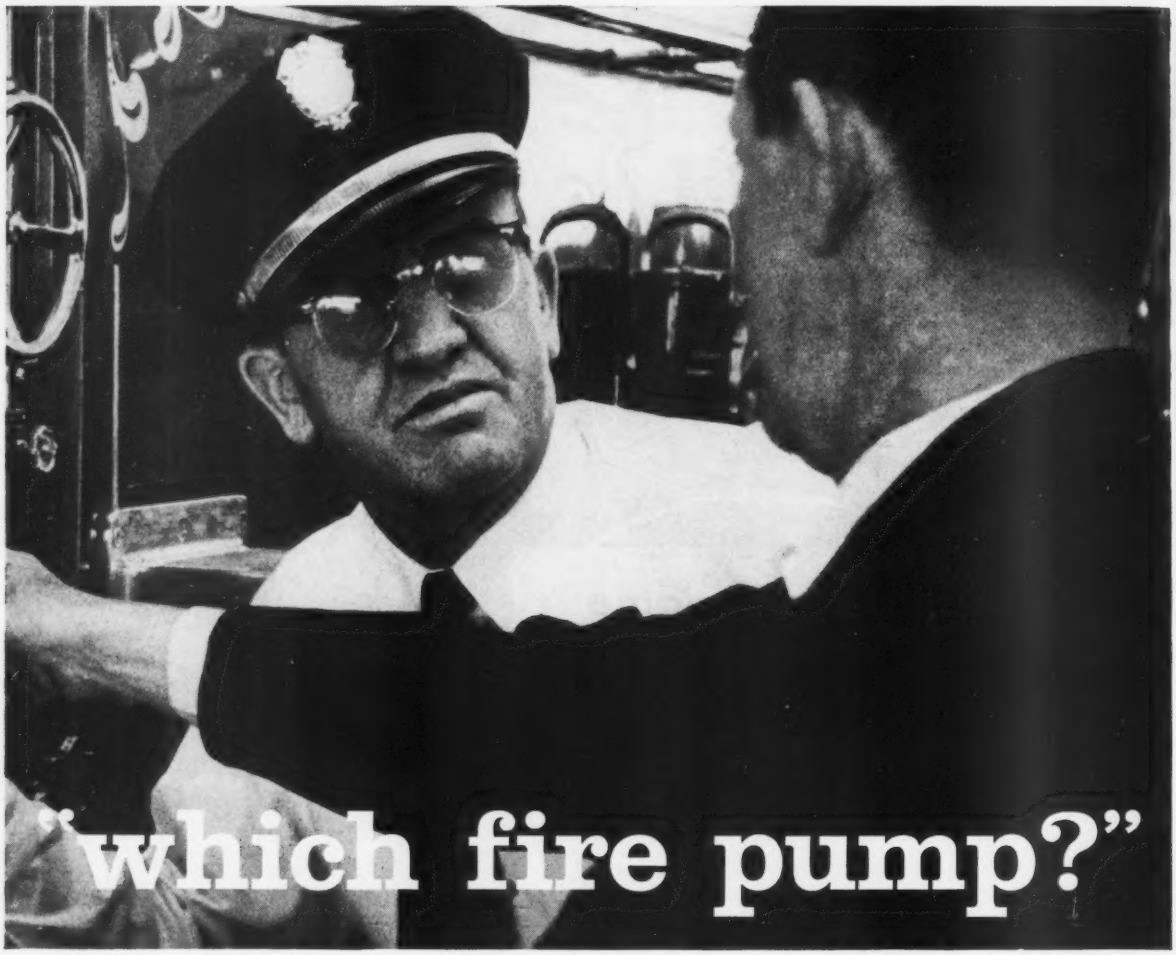


And remember—they're made by the world's largest commercial vehicle manufacturer exclusively. There's a complete line available, and their modest price tags will amaze you. Check that at your nearest GMC truck dealer's!

GMC TRUCK & COACH – *A General Motors Division*

GMC-America's Ablest Trucks

½ to 45 tons



"which fire pump?"

First choice for performance—the completely power-controlled Waterous Electro-Matic*

More and more men who know fire pumps are choosing the new WATEROUS Electro-Matic. Why? Because it's modern, it's automatic, it's dependable. Push-button controls reduce error, provide greater safety. Pump is engaged at the flip of a switch; lights show whether the shift is in "road" or "pump"; the powerful primer goes into action with the push of a button; the "volume-pressure" switch controls the transfer valve and lights unmistakably tell the position of the valve. Electro-Matic gets water onto the fire quicker, with foolproof operation.

Here's the WATEROUS Electro-Matic discharge valve. Smooth operation, no sudden, dangerous pressure surges. Push the button to unlock, position, or lock. Fast, positive, dependable, it seals against both vacuum and pressure. It's another reason why more cities are choosing the Electro-Matic.

FREE BOOKLET gives complete details on *Electro-Matic* controls, design, maintenance ease and adaptability to all modern chassis. Write today for your copy.

Dept. 304

WATEROUS

80 E. Fillmore Ave., St. Paul, Minnesota

Electro-Matic

*Registration applied for.

See the WATEROUS ELECTRO-MATIC in action in Booth No. 44 at the International Association of Fire Chiefs Convention, Shrine Exposition Hall, Los Angeles, September 16-19, 1958.

EVERY GLOBE SUIT OFFERS YOU THESE OUTSTANDING FEATURES . . .

STANDARD SINCE 1901

BASIC GLOBE SUIT

OUTSIDE FABRIC
Rugged, water repellent, fire retardant, pre-shrunk, firmly woven duck; all yarns plied, doubled and twisted for extra strength; resists snagging and tearing.

INTERLINING
100% DuPont Neoprene retains extreme pliability at high temperatures and in extreme cold; resists deteriorating chemicals and "air rot"

LINING
Sanforized lightweight plaid flannel

BODY
2-piece with double-stitched back seam

SLEEVES
Set-in with fitted shoulders; snug-fitting 100% wool knit wristers provide extra comfort and protection

COLLAR
5" Hockmeyer water repellent corduroy collar, worn up or down, protects neck; adjustable straps insure tight fit, keeps out water and sparks; multiple stitched with Neoprene lining

POCKETS
4 large, tearproof construction pockets with Wentworth patent pocket stays and fasteners

FLAP
6" no-gap, storm flap on Coat front protects body fully against weather and water; rust-proof quick-button snaps

FASTENERS
Aluminum (rust proof), non-sparking safety snap and D-ring fasteners are anchored to coat by capped rivets

SEAMS
Reinforced and double-stitched; all seams in Neoprene interlining are brush coated with neoprene for waterproofing

FLAP
The original "Quick-Hitch" flap, used in Globe Pants since 1901, affords fast, easy entry and complete protection

QUICK-HITCH D-RING
Highly rust-resistant quick-hitch safety snap and ring fasteners riveted to Pants

ADJUSTABLE WAIST STRAP
Selected leather take-up strap allows full waist adjustment for comfort

RIVETS
At all points of extra strain, reinforcing rivets — fully capped for maximum protection — are used

SUSPENDER BUTTONS
8 metal, rust-resistant suspender buttons securely riveted to duck

3M Aluminized fabric now available in all GLOBE Suits

GLOBE FIREMEN'S SUITS

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GLOBE MANUFACTURING CO. - PITTSFIELD, NEW HAMPSHIRE

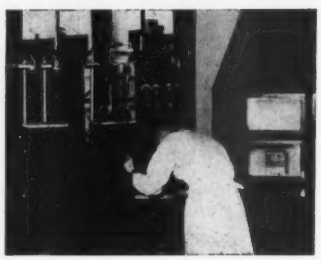
Shielding your plant from fire

. . . through quality control

of AER-O-FOAM liquids

From the time raw materials are received until finished products are shipped, National AER-O-FOAM liquids undergo 70 separate inspections.

This, we believe, is the most rigid system of quality control in the industry. Every safety engineer can have full confidence that foams made with National liquids will have full extinguishing power.



Laboratory tests *check* AER-O-FOAM *through every stage of manufacture, up to day of shipment.*

NATIONAL FOAM System, Inc.

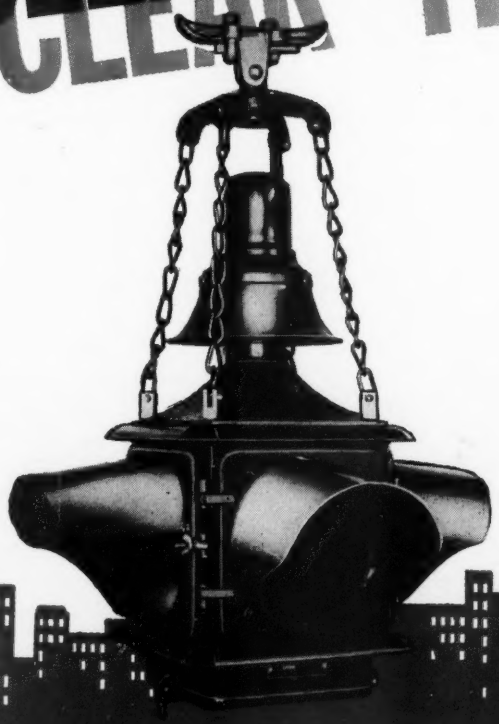
West Chester, Pa.

CLEAR THE LANE

say it
twice with this

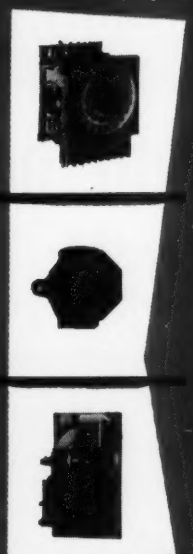
EAGLE

BEACON SIREN



Drivers see the flashing light over the noise of traffic and car radios, hear the siren warning though vision may be obscured. This double-warning, double-safety unit may be suspended at fire lane intersections, or mounted on mast arms or post top. Non adjustable beacon-siren like that shown may have flasher mounted internally.

Directionally adjustable units also available, for post top mounting only. For complete details on Eagle Beacon-Siren units and related equipment send coupon today.



RELATED EQUIPMENT

TIME LIMIT SWITCH
Controls beacon-siren "on" interval. Adjusts from 2 seconds to 20 minutes.

PUSH BUTTON SWITCH
Weatherproof, actuates Time Limit Switch shown above.

TWO-CIRCUIT FLASHER SET
One circuit at sixty flashes per minute operates the flashing beacon. The other circuit operates at 30 "wails" per minute.

EAGLE

EAGLE SIGNAL CORPORATION
Municipal Division Moline, Illinois
Eagle equipment saves lives . . . saves time

MAIL COUPON TODAY

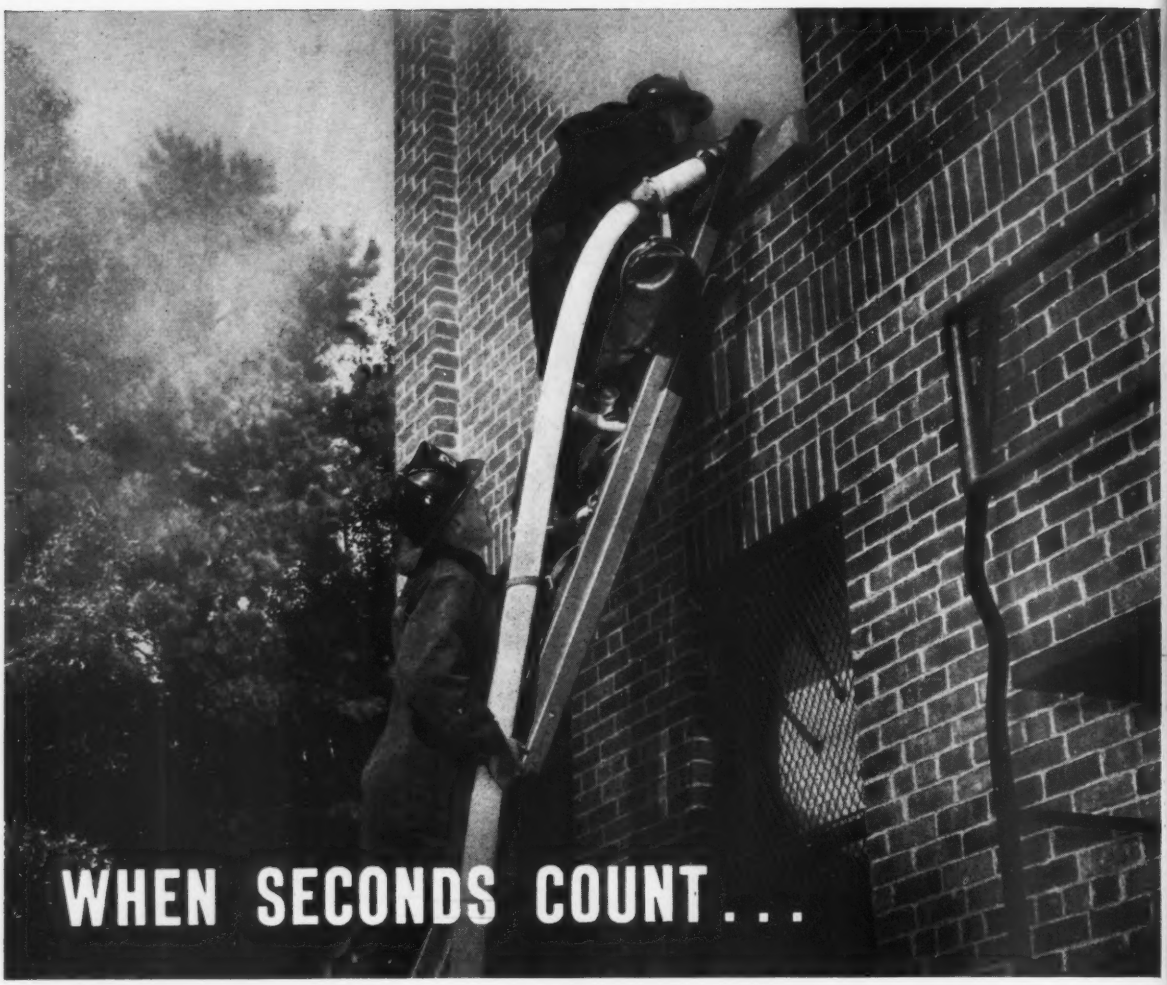
EAGLE SIGNAL CORPORATION, Municipal Division,
Dept. FE-858, Moline, Illinois

Please send complete information on Eagle's new emergency traffic control system.

NAME AND TITLE

MUNICIPALITY

FULL ADDRESS



Lightweight hose made with DACRON® gets into action fast

REG. U. S. PAT. OFF.

Easy handling of hose containing "Dacron" comes from its light weight and flexibility.

Compact—over 1,000 feet of hose containing "Dacron" fits easily into most pumpers.

Hose containing Du Pont "Dacron"* polyester fiber is stronger, yet lighter, than ordinary hose. It is also more flexible and easier to handle. That's why hose made with filler cords of "Dacron" contributes to the high efficiency of today's fire fighters. Hose made with "Dacron" is produced by all fire-hose manufacturers. The next time you buy hose, be sure it's made with "Dacron". E. I. du Pont de Nemours & Co. (Inc.), Textile Fibers Department, Wilmington 98, Delaware.

DU PONT
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*"Dacron" is Du Pont's registered trademark for its polyester fiber.

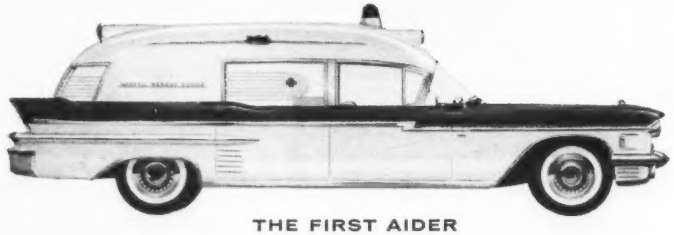
BETTER THINGS FOR BETTER LIVING...*THROUGH CHEMISTRY*

FIRE HOSE MADE WITH "DACRON" is easier to handle... gives improved performance... packs more compactly.

NEW HORIZONS IN AMBULANCE EFFICIENCY AND BEAUTY

THE SENTINEL

THE VOLUNTEER



THE FIRST AIDER

Miller-Meteor underscores its growing leadership with the most advanced ambulances ever produced. New horizons of efficiency and beauty are achieved in all of M-M's 21 different models in three spectacular series: THE SENTINEL—lowest profile with dramatic Flight-Sweep styling; THE VOLUNTEER—extra roominess (48″ headroom) with sweeping modern lines; THE FIRST AIDER —"hospital on wheels" with walk-around (52½″) headroom. Exclusive, new Safe-T-Vu Roof Lights that flash warning at sides as well as front and back . . . Sit-Rite Attendants' Seats with greater legroom . . . and more convenient storage compartments head a long parade of advanced functional features. Contact your Miller-Meteor Distributor now.

MILLER-METEOR MOTOR CAR DIVISION • BELLEFONTAINE, OHIO

DIVCO-WAYNE CORPORATION

The Master Craftsmen of Ambulances and Funeral Coaches with Chassis by Cadillac

1945
Cleveland (Tenn.) Police Department installs General Electric two-way radio

1954
County Sheriff's Patrol installs General Electric two-way radio

1955
Cleveland Fire Department installs General Electric two-way radio

1956
Cleveland power system installs General Electric two-way radio

Why did they all choose General Electric?

The answer is easy: Only General Electric's Progress Line gives you all three

—completely interchangeable plug-in chassis

—pre-tested, communication-type tubes for rugged mobile duty

—controlled reluctance microphones (in mobiles *and* base stations) for clearer voice transmission

—*all at no extra cost!*

Authorized General Electric service is available everywhere in the U. S.

Find out how your city can use General Electric two-way radio for more efficient municipal services. Call your G-E communications consultant, listed under "Radio Communication Equipment" in the Yellow Pages. Or write General Electric Co., Communication Products Dept., 1288, Syracuse, N. Y.

Progress Is Our Most Important Product

GENERAL ELECTRIC

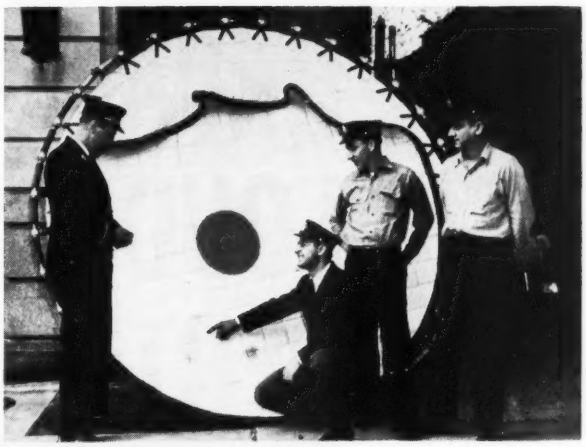
TO GET ONLY THE VERY BEST *SPECIFY. . . . .*

ATLAS DELUXE LIFE SAVING NET

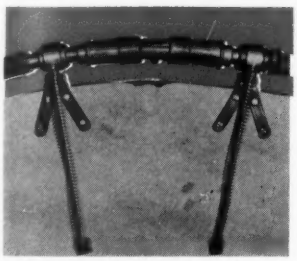
PREFERRED BY FIRE CHIEFS EVERYWHERE

EXCLUSIVE ATLAS FEATURES

1. SELF LOCKING HINGES AND SLEEVES
2. DUAL PATENTED SHOCK ABSORBERS
3. TWIN LEATHER STRAPS
4. MOLDED RUBBER HAND GRIPS
5. ONE PIECE CANVAS BOTTOM



Battalion Chief Gerow, H & L Co. 80, Port Richmond, S. I., inspecting Atlas "Deluxe" Life Net after 7th floor rescue, April 27th



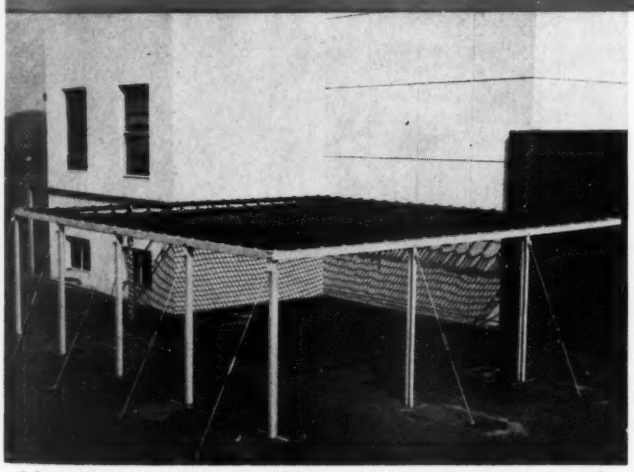
Atlas Hinges and Sleeves—Safer—Prevent Injury

Twin Leather Straps Spaced Evenly—Added Safety

Dual Pat. Shock Absorbers Make Safe Rescues Possible Without Shock to Firemen.

VISIT BOOTH NO. 77, IAFC, LA

SPECIFY "ATLAS"



Atlas drill tower safety net and frame at Los Angeles County, one of many throughout the country

THE ONLY DRILL TOWER SAFETY NET AND FRAME ASSEMBLY SPECIFICALLY ENGINEERED FOR THE FIRE SERVICE.

WRITE FOR DETAILS—TODAY

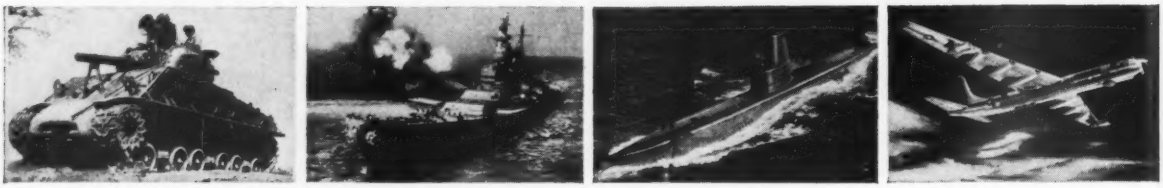
DESIGNED FOR YOUR PARTICULAR NEEDS!

EACH ATLAS Drill Tower Safety Net and Frame is designed with the particular needs of the individual Training Center in mind. Your problems are considered by our Engineering Department, and complete blueprints are furnished for installation.

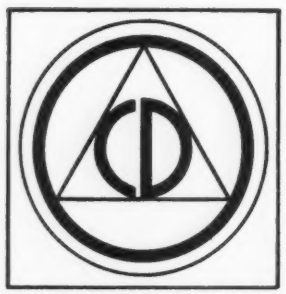
Send us the height and width of your Drill Tower . . . leave the rest to us. Our experience guarantees only the finest, safest, and most dependable in Drill Tower Frames and Nets.

ATLAS SAFETY EQUIPMENT CO., INC. — 179 NORTH 10th STREET — BROOKLYN 11, N. Y.

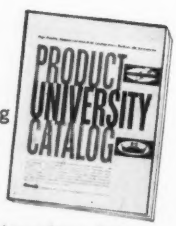
Proved by use in all branches of the Army, Navy and Air Force



UNIVERSITY LOUDSPEAKERS CERTIFIED BY FCDA* FOR CIVIL DEFENSE



*Federal Civil Defense Administration



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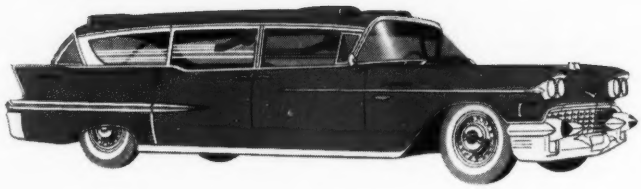
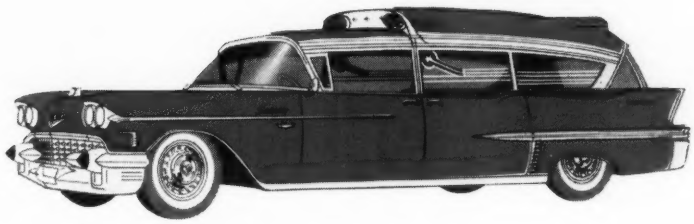




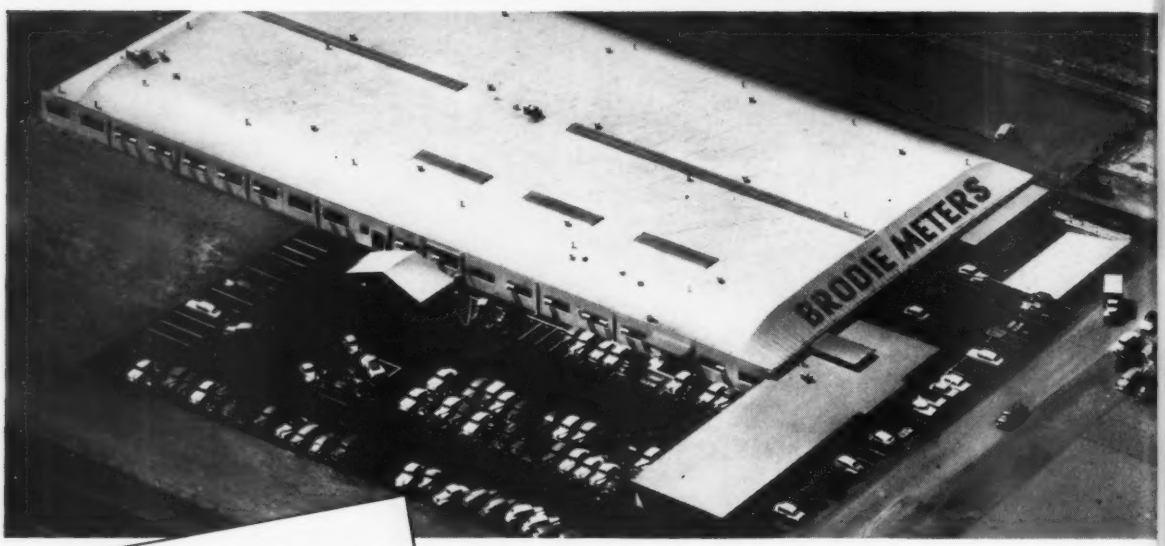
In any emergency, you can always count on SUPERIOR

Why? Experience! Superior craftsmen have been building fine coaches for thirty-five years. Superior designers and engineers are aware of the exacting requirements of a professional emergency vehicle. Superior pioneered the first all-steel coach body, and it's still the strongest, safest in the industry. Combine coach engineering and manufacturing know-how with the time-tested performance of famous Cadillac chassis and power plants, and you can enjoy the confidence born of experience. In any emergency, be safe, be sure . . . with Superior.

SUPERIOR COACH CORPORATION • Lima, Ohio
Plants in Lima, Ohio • Kosciusko, Miss.

Superior's three headroom heights for every emergency need—routine trips, heavy duty or disaster work. All feature all-steel welded construction, low loading height, generous working space, provision for full auxiliary equipment.

Gets Better FIRE and BURGLARY Protection
and SAVES $5,000 a year



Having located our plant on a large open site to permit continued expansion, we have an unusual degree of isolation. This multiplies the importance of ADT Automatic Protection Services in safeguarding our highly specialized machine tools, precision testing equipment, and costly inventories. While largely eliminating human error from our protection problem, ADT saves us approximately $5,000 per year.

J. Van Brodie

Manager of Production,
Corporate Director

Ralph N. Brodie Company

San Leandro, Calif.

Safeguards Its Property *Automatically*

Ralph N. Brodie Company is a pioneer developer of liquid meters and measuring instruments used by the petroleum industry. Consistent growth since 1927 led to the erection in 1952 of the company's large and thoroughly modern plant at San Leandro, California.

A combination of ADT Automatic Protection Services stands guard over the entire premises to detect and report fire, burglary and other dangerous conditions. Central Station Sprinkler Supervisory and Waterflow Alarm Service safeguards the sprinkler system against human failures and summons the fire department *automatically* when water flows. ADT Burglar Alarm Service guards doors, windows and vault against unauthorized entry and *automatically* notifies protective forces in case of attack.

Like the Ralph N. Brodie Company, thousands of business concerns from coast to coast use and endorse ADT Automatic Protection because they know that it gives greater security for property, profits and employees' jobs than can be obtained otherwise, and *at less expense.*

May we show you what ADT can do for you?

Whether your premises are old or new, sprinklered or unsprinklered, an ADT specialist will show you how an appropriate combination of ADT Automatic Protection Services can guard your property, effectively and economically. Call our local sales office if we are listed in your phone book; or write to our Executive Office.

ADT

Controlled Companies of

AMERICAN DISTRICT TELEGRAPH COMPANY

Executive Office:

155 Sixth Avenue, New York 13, N. Y.

A Nationwide Organization

if your men aren't wearing Bullard helmets... head protection is costing you too much!

MORE FIRES FOR YOUR MONEY!

Expose rugged Bullard HARDBOILED fire helmets to searing flame (high as 2,000° F.), freeze them, soak them in boiling water... these grueling punishments won't soften or weaken a Bullard fire helmet's protective characteristics! This is the only fire hat that exceeds Federal specifications. No Fire Helmet is tougher, yet few are as comfortable to wear. Light and cool on your head... made from non-conductive fiber glass they weigh only 20 ounces. In a choice of permanent non-fading colors, these helmets are equipped with replaceable suspensions that adjust to all standard head sizes. Today, ask to see how Bullard Fire Helmets make your budget go further... help you fight more fires for the money!

Stop First Aid Water Damage

New Bullard Fire Department First Aid Kits are 100% water proof. Every supply is separetely sealed in Polyethylene wrappers. Includes the new approved, spray-on, pain killing burn treatment... *First On Burns.*

Economy Gas Masks

Equip your units with gas masks at a 12% saving. Bullard "SMOKE-EATER" gas masks contain exclusive money saving filter for toxic dusts, fumes, mists, fogs, and smoke.

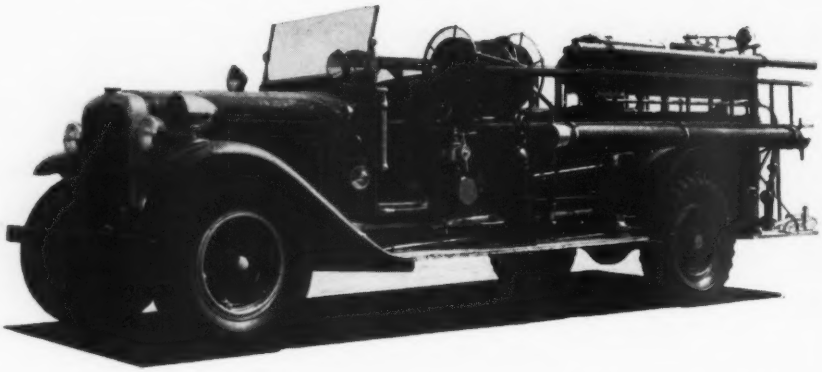
BULLARD
INDUSTRIAL SAFETY EQUIPMENT

E. D. BULLARD COMPANY SAUSALITO, CALIFORNIA

See your local fire equipment dealer or write for catalog of complete line of fire helmet accessories.

LOGANSPORT, IND. REPLACES BOYER AFTER 27 YEARS OF CONTINUOUS SERVICE

OLD



Old Boyer purchased in 1930 will still see some service as a reserve truck for Logansport Fire Dept. built on a custom chassis with a Continental Engine and a Hale 750 GPM rotary gear pump.

NEW

New Boyer delivered to Logansport, Ind. the home of our industry for 78 years.
Built on a International R-196 chassis, RD 501, six cyl. engine, 212 brake horsepower, Hale QL 750 GPM pump and FZZ portable pump, 600 gallon separate from body booster tank, built in Rockwood Foam-Wet water system. Large side and rear compartments for much required equipment, body of heavy gauge steel and built to last.

Dependable Fire Fighting Equipment

by UNIVERSAL FIRE APPARATUS CORP.

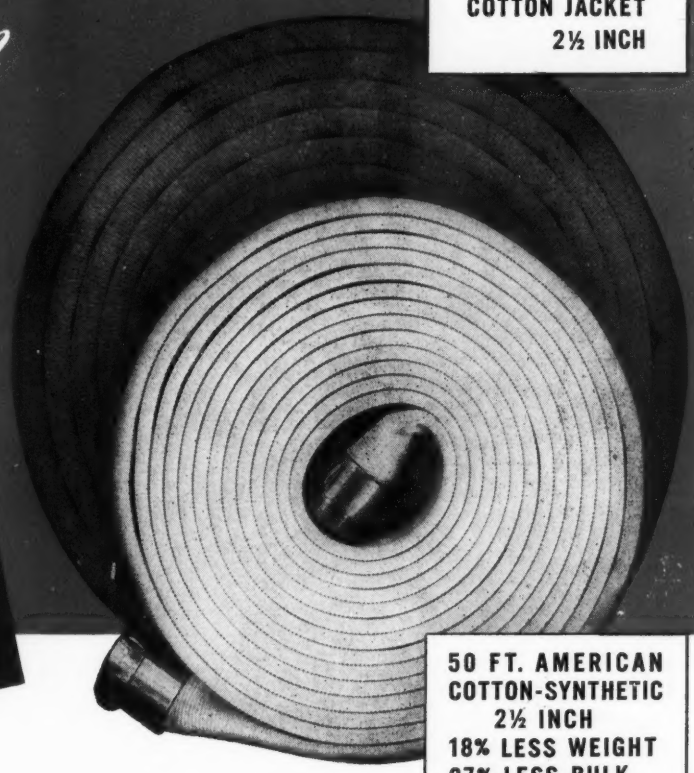
LOGANSPORT, INDIANA

A GREAT HOSE PROVED BY YEARS OF FIELD TESTING

THE *American*

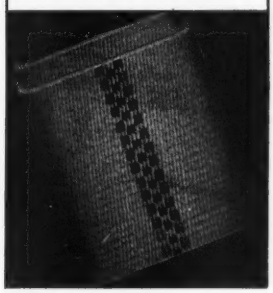
COTTON-SYNTHETIC JACKET *Hose*

400 AND 600 LB. TEST



50 FT. ORDINARY COTTON JACKET 2½ INCH

50 FT. AMERICAN COTTON-SYNTHETIC 2½ INCH
18% LESS WEIGHT
27% LESS BULK
50% STRONGER



Try this great new hose. See for yourself how its long-lived cotton-synthetic jacket and laminated natural rubber lining make for easy handling, while saving space and weight. Here's the story —

EASIER TO HANDLE—50′ of this AMERICAN Cotton-Synthetic Hose weighs 18% less than 50′ of average cotton jacket hose . . . enables firemen to move more hose faster. Also lies flatter, coils better, stays flexible wet or dry.

SAVES SPACE—AMERICAN Cotton-Synthetic enables you to carry at least 25% more hose.

STRONGER—High strength-to-weight ratio remains same wet or dry . . . tests prove it 50% stronger than regular hose.

Why lug heavy, bulky, hard-to-handle hose?
Order AMERICAN Cotton-Synthetic Jacket Hose—available in 400 and 600-lb. test—from your dealer NOW. . . or write us for details.

THE *American* RUBBER MANUFACTURING CO.

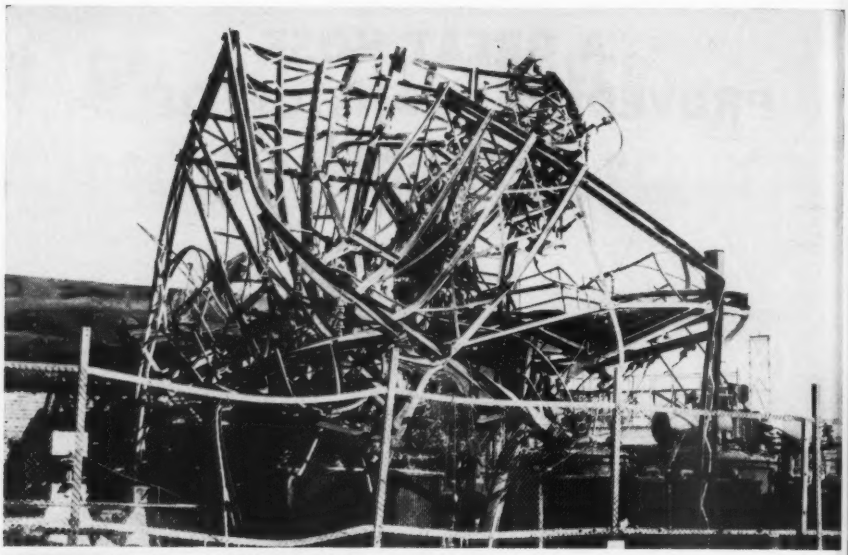
AR-26

MAKE SURE; Look for Identifying Stripe and Test Report

AMERICAN Cotton-Synthetic Jacket Hose has red, white, and blue identifying stripe. Each 50′ length is factory proof tested with couplings on, for strength, stretch, and twist. Test report accompanies hose.

Factory & General Offices: • 1145 Park Avenue • Oakland 8, California • Phone OLympic 2-0800

special hazard fires...



need Grinnell Special Hazard Protection

Fairly commonplace in industry today are extra hazardous areas, where special protection must be provided to assure against possible serious loss by fire. Naturally *you* can't be expected to know *all* the answers about every type of fire hazard. But Grinnell, with 87 years' experience protecting against fire hazards of every description, has thorough background knowledge upon which you can draw. Let a Grinnell Fire Protection Engineer recommend the best system under every circumstance. Write Grinnell Company, Inc., 277 West Exchange Street, Providence 1, Rhode Island.

There's a GRINNELL Fire Protection System for every fire hazard, regular or special.

- Automatic spray sprinkler systems: wet pipe, dry pipe, deluge and Simplex*.
- Water spray systems with regular or Self-con* (self-contained) water supplies; automatic detection; Multitrol*, Multimatic* or manual releases; ProtectoSpray* nozzles or Mulsifyre* projectors.
- ProtectoFoam* systems: producing mechanical foam blankets.
- Carbon dioxide systems.
- Dry Chemical systems.

For many fire hazards, these Grinnell systems offer a choice of extinguishment or control methods and materials, such as: vapor or gas dilution; emulsion extinguishment; protective cooling; insulation; and controlled burning.

*Trade Name Registered

GRINNELL

WHENEVER FIRE PROTECTION IS INVOLVED

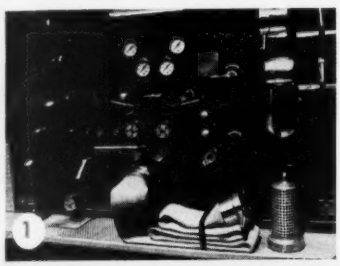
Manufacturing, Engineering, and Installation of Fire Protection Systems since 1870

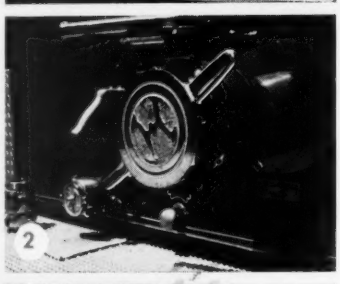
KEYSTONE HYDRANT VALVE Story

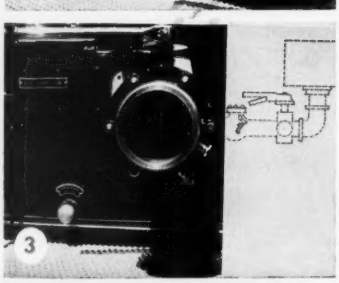
TOLD IN 10 PICTURES

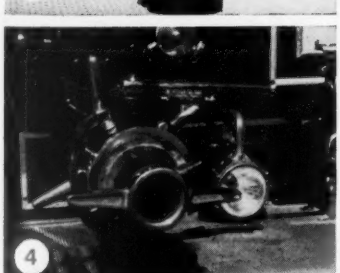
- **QUARTER TURN**
- **OPENS EASILY**

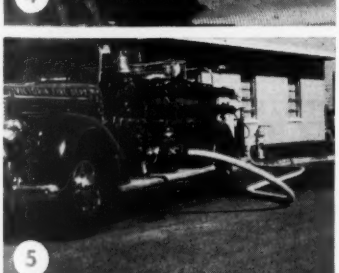
with opening diameter same as pump suction, permitting full flow of water at major fires











1 With the Keystone Hydrant Valve, a large suction hose can be carried attached to the pump suction with a wet pump permitting instant pumping of water on the fire truck and can be switched to hydrant water supply without stoppage of water, assuring complete safety at all fires. A connection of soft suction hose to the hydrant steamer becomes a one man operation with ease. (Not possible with 2½" valved suction)

2 The Keystone Hydrant Valve can be applied to old or new pumpers instantly and without any mechanical changes in pumper construction.

3 With the Keystone Hydrant Valve on pump suction, a swing check valve may be installed between the booster water tank and pump suction permitting tank suction to remain open at all times except when drafting water from rivers, creeks, etc. This feature makes operation of the pumper less difficult. (If the pump is carried wet (primed) and the 2½" valved suction is used, the swing check valve in line between the pump and tank would permit water to run out of booster water tank when attaching hose to the pump suction)

4 By applying a reduction hydrant adapter to a Keystone male thread will permit feeding pumper with 2½" fire hose. (This is also possible with the 2½" valved suction)

5 When using a reducing adapter on the male thread of a Keystone Hydrant Valve, the pumper can be fed direct from the 2½" outlet on the water hydrant with 2½" fire hose. (This can also be accomplished with the 2½" valved suction)

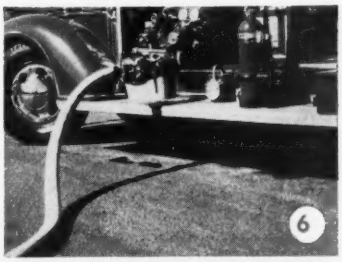
6 When using a reducer adapter on a Keystone male thread, the pumper can be fed through hundreds of feet of 2½" fire hose in relay from another pumper at a water hydrant or other source of water. (This is possible with the 2½" valved suction)

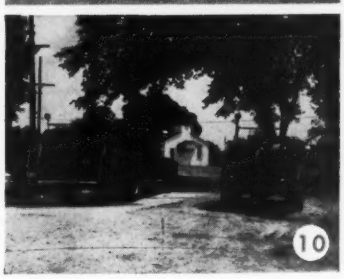
7 With an air bleeder on a Keystone Hydrant Valve, all air that is ahead of water in long hose lines can be bled from the hose before the valve is opened to relieve the shock on the pump and to prevent the stoppage of pumping. (This is possible with the 2½" valved suction)

8 Application of Keystone Hydrant Valve connected to steamer outlet will permit second truck to get hydrant connected instantly without water stoppage when operating from hydrant to fire, eliminating delay. (Not possible with a 2½" valved suction on truck)

9 For oil refineries, chemical and other industrial plants that have conventional cast hydrants with steamer connections, the Keystone Hydrant Valve can be attached to the hydrant steamer and early arrived crew can pump on fire with 2½" outlet on hydrant to cool tanks, etc., while awaiting arrival of foam or other pumper. The foam or other pumper can connect hydrant without water stoppage during sequence of operation. (Not possible with 2½" valved suction on truck)

10 In the case when water mains are generous but hydrants not closely spaced, pumpers equipped with Keystone Valves on both suctions will permit six or more 2½" hose lines of short lengths with minimum friction losses and maximum volumes all without water stoppage during entire operation. (Utmost speed—low hose pressures—low engine speeds.) (This is not possible with the 2½" valve suction)





KEYSTONE VALVE CORP.

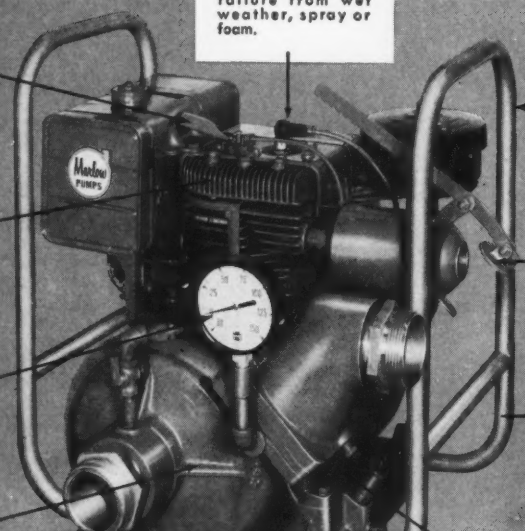
P. O. BOX 6716

5325 KIRBY DRIVE HOUSTON 5, TEXAS

REPRESENTATIVES IN VARIOUS CITIES THROUGHOUT THE WORLD

For Dependability

MARLOW Fire Fighting PUMPS



Weather Proof: Shielded spark plug connection prevents failure from wet weather, spray or foam.

Accessible Throttle: Remote control throttle located on the top of the engine simplifies operation.

Easy to Carry: Strong handles placed conveniently make carrying easy for two men at any pace.

Fast Starting: Dependable, four-cycle engine assures fast starting and unattended operation.

Exhaust Primer: Primes pump in a few seconds, easily accessible to pump operator.

Vacuum and Pressure Gauge: Two-way gauge shows vacuum when priming, then allows operator to check pressure while pumping.

Compact Design: Fits small compartments on pumpers or car trunks, jeeps and pickups.

Light Weight Construction: Ribbed aluminum withstands high pressures, makes unit readily portable. Weighs only 160 lbs. with gas and oil, ready to run.

No Hand Valves: Automatic check valve seals discharge while priming, swings out of the way when pumping.

Sturdy Base: Rigid mount with roll over feature can be easily lifted or skidded without damage to unit.

Marlow light-weight pumps provide dependable fire protection for municipalities, industrial plants and farms. This pump, designed especially for the job, is indispensable to Fire Departments both large and small. With a supply of surface water, a stream or well, this portable pump becomes an extremely efficient fire fighting unit.

This highly-portable unit can be placed in a car or jeep and dispatched quickly in an emergency or it can be carried into rough areas that are inaccessible to pumpers and trucks. This powerful pump is equally well suited for fire fighting or booster service. Developing over 100 pounds pressure, it can be used on low-pressure fog or foam operations.

Write today for specifications and the name of your nearest Marlow dealer.

Marlow PUMPS

DIVISION OF

BELL & GOSSETT CO.

Midland Park, New Jersey

Longview, Texas • Morton Grove, Illinois

DUO Safety

FIRE LADDERS

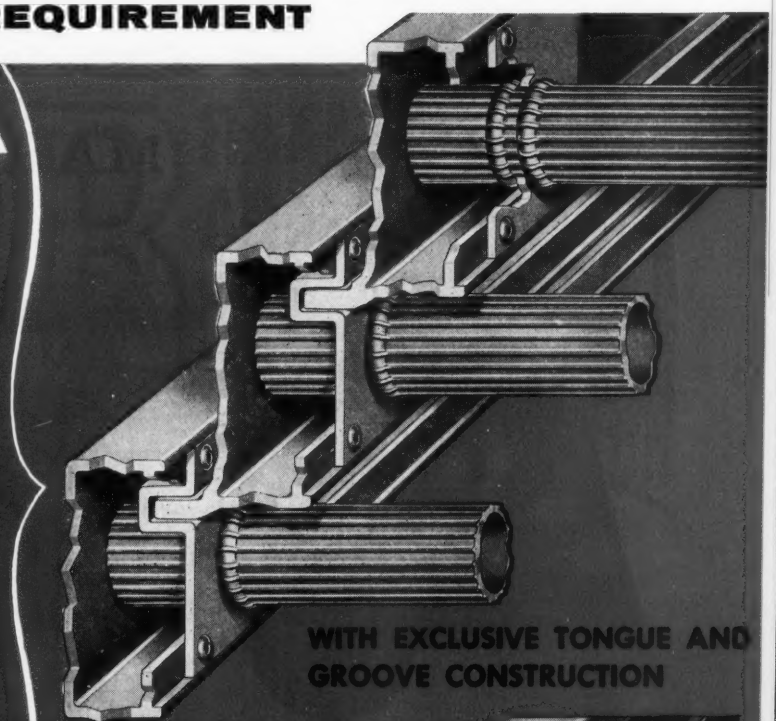
NOW...YOUR CHOICE OF AN ALUMINUM FIRE LADDER FOR EVERY USE... EVERY REQUIREMENT

SERIES 1000-A
For Pumper Use

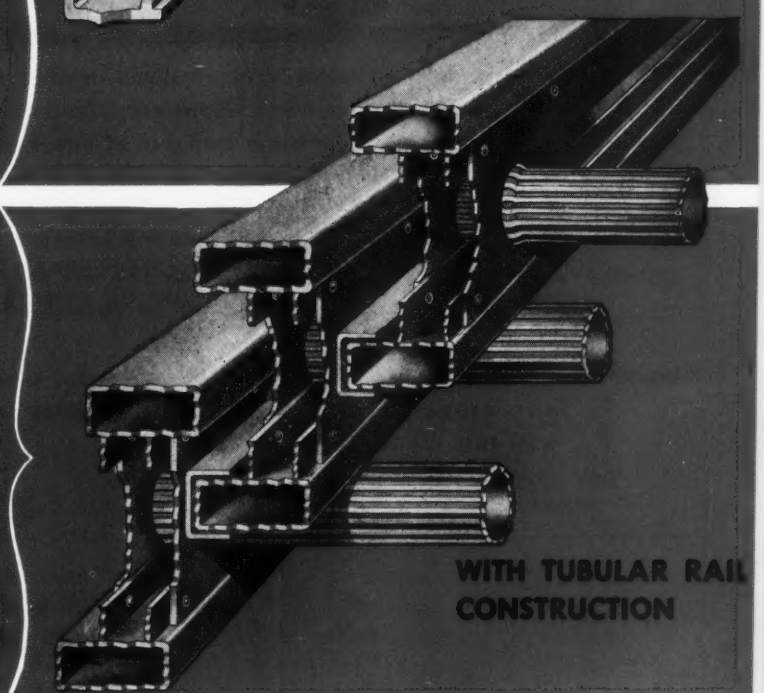
Featuring lightweight Channel Rail Con-uction, and is the substitute, in aluminum, for id side wood ladders. This outstanding fire dder has exclusive tongue and groove arrange-ent, Duo-Safety's construction development at holds sections together firmly, rigidly, with hooks, guides, or obstructions of any kind! equires minimum banking height. In two and ree sections, in lengths up to 30 feet. Rail di-ensions—1¼" x 2¾".

SERIES 900-A
For Service Trucks and Pumper Use

An intermediate ladder in both size and eight, the 900-A Series features slightly heavier onstruction than the 1000-A Series, but has the me outstanding features. In two and three sec-ons...in lengths up to 40 feet. Rail dimensions 1¼" x 3¼".



WITH EXCLUSIVE TONGUE AND GROOVE CONSTRUCTION



WITH TUBULAR RAIL CONSTRUCTION

SERIES 500-A
For Service Trucks

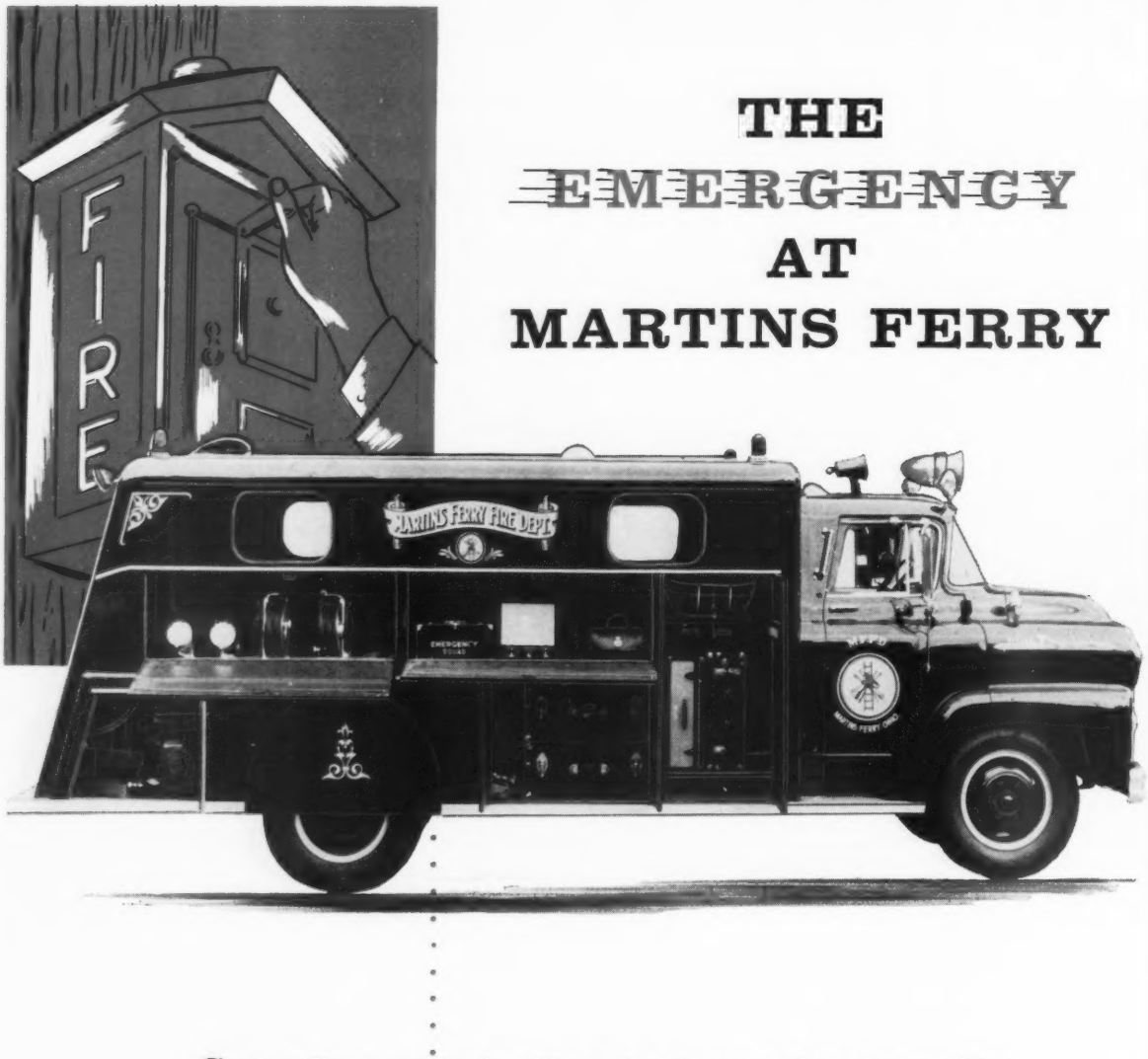
Famous aluminum fire ladder that replaces ood truss ladders and features Tubular Rail onstruction for greater strength and extraor-nary safety. Adopted as standard ladder equip-ent by fire departments the country over. Made roof and wall ladders...and in two and three ction extensions in lengths up to 65 feet.

DUO Safety

DUO-SAFETY LADDER CORPORATION

809 NINTH STREET
OSHKOSH, WISCONSIN

In Canada: LaFrance Fire Engine and Foamite, Ltd., Toronto



THE EMERGENCY AT MARTINS FERRY

Saving lives at Martins Ferry has been made more positive with the public subscription purchase of this new Sharpsville Emergency Truck. Now all necessary life-saving equipment is available when needed, including even a piped oxygen system for use en route!

Sharpsville can provide engineered equipment to handle any situation you might face, too! A request on your letter head will put us in action.

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Better today than ever before in our 79 years of fine badge making —better through employment of latest techniques plus greater experience. We offer the widest selection of badge designs—all available in a wealth of excellent materials. Any badge you want can be had in nickel, chromium, rhodium, sterling silver, gold plate, permaglo, gold filled and 14 kt. gold.

We can give you a completely new, distinctive and exclusive badge, designed expressly for your department.

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Send for new price list on badges illustrated in our Diamond Jubilee Catalog.

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PRESIDENT

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Please send me your Diamond Jubilee catalog _____
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This, gentlemen is "IT" — something you've been waiting for!

Young

Noted for quality fire apparatus

GIVES YOU — a sensational new pumper with features far ahead of some of the most expensive pumpers —at a price you can afford. There is nothing finer on the market today.

Here is, dollar for dollar, the biggest pumper value any fire company can buy. On a rugged 257 H.P. International Harvester chassis incorporating the amazing "Select-O-Matic" transmission we provide the following:

Dual Pumps—the new Hale 2CBF, power take-off driven high pressure pump (You can drive and pump at the same time for grass fires.) plus the famous Hale volume pump (up to 1000 GPM).

Heated booster reels (note how low they are for better rear vision and weight balance).

High capacity booster tanks (600 gallon shown).

Full depth compartments (all of them) with extra heavy box doors and ventilating louvers.

Workmanship unequalled which results in longer apparatus life.

Fully approved by the Underwriter's, this pumper is in a class by itself. For more information why not write us today or contact one of our representatives.

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1548 WILLIAM STREET *BUFFALO 6, NEW YORK*

James Winner, 1018 Grandview Ave., Perrysville Branch, Pittsburgh 37, Pa.
Ray Hanbury, 7550 Allentown Rd., Washington 22, D. C.
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A SCREAM *generally accompanies*

The Most Excruciating Of All Pain Wounds—

SOMETHING NEW UNDER THE SUN!
KONKR-BURN
CONQUERS BURNS
for BURNS, SUNBURN, STINGS, SCRATCHES, CUTS
NEEDED WHEREVER HUMANS LIVE, WORK or PLAY!

BURNS!

And Now, For the Relief of Humanity

THE BRILLIANT NEW MEDICAL DISCOVERY

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CONQUERS BURNS, SUNBURN, CUTS, STINGS and SCRATCHES
KONKR-BURN
KING OF THEM ALL
SATISFACTION GUARANTEED OR MONEY REFUNDED!
SEND $1. TODAY!
We'll rush a bottle to You at once!

FIRE DEPT'S EVERYWHERE ARE WELCOMING IT WITH OPEN ARMS

IT'S FOR WHAT KIND OF BURNS?

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Electrical	Sunburn
Acid	Man-O-War Stings
Powder	Bee Stings
Match	Mosquito Bites
Steam	Cuts — Scratches
Gasoline	Chafing
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Also for many Skin Ailments

WHAT DOES IT DO?

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Kills pain almost instantly!
Immediately ready—Easy to apply!
Thoroughly Antiseptic and Safe!
Permits patient to move freely without pain because wound kept soft and pliable!
Promotes Rapid Healing! Soothing!
All without any "micins" or "caines"!
And no Anesthetics or Narcotics used!

"Use It Once — You'll Never Be Without It!"

McCann Products Co.

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Gentlemen—
Enclosed herewith find $1. Please send one $1.50 plastic bottle of KONKR-BURN, shipping charges prepaid.

Name_____

Address_____

You can bet a fireman designed this pump!

From harness to shut-off nozzle, the Dragon Fire Pump is designed from the firefighter's point of view . . . has *everything* he wants in a back-pack pump. And it boosts his efficiency by cutting down fatigue.

The special Dragon harness is easy to get into and designed so the pump rides high on the fireman's back where it can't throw him off balance or interfere with walking or climbing. Just a few easy strokes of the pump lever gives the operator a *continuous* flow of water he can direct right where it does the most good. And a mere twist of the shut-off nozzle gives either solid stream or spray *instantly*.

Here's another advantage the firefighter appreciates! When he's using a Dragon Fire Pump, he can take his hands off both shut-off nozzle and pump lever to use rake, shovel, or other tool.

A Dragon Fire Pump comes *completely assembled* and requires little maintenance. There is no pump packing to dry out: even after standing idle for long periods, the pump is ready for instant use.

PARCO PRODUCTS COMPANY

PENNSBURG, PENNSYLVANIA

Dragon FIRE PUMPS

now available in 2 models

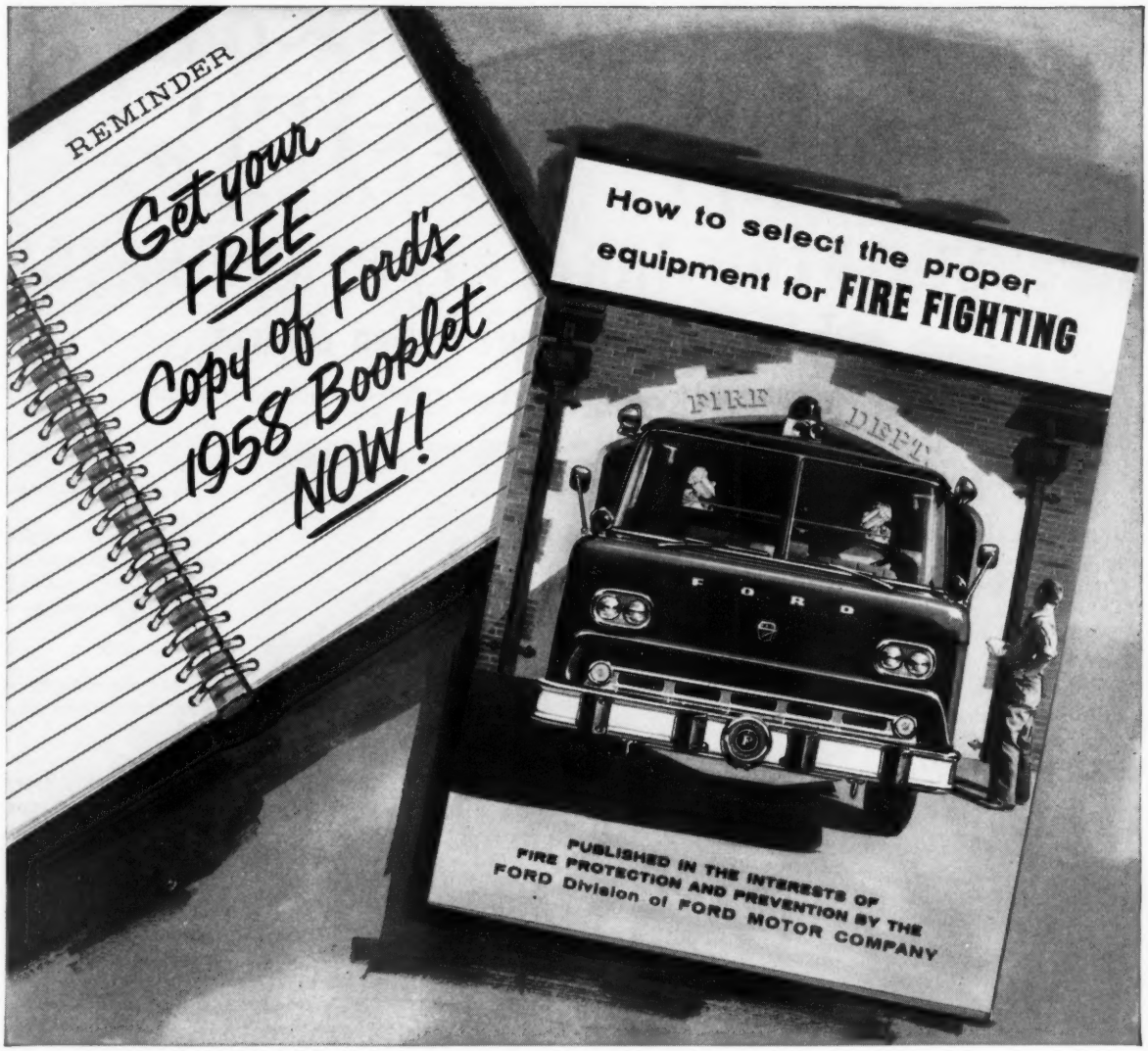
No. 150-S—Stainless Steel Tank

No. 150-G — Galvanized Tank: Cold-rolled steel, hot-dipped galvanized after fabrication.

All units equipped with brass pumps; all tanks seam welded. Capacity 5 gallons

DRAGON FIRE PUMPS meet Underwriters' Laboratories requirements and can be supplied with the UL label of inspection attached.

VALUABLE DISTRIBUTORSHIPS AVAILABLE, WRITE TODAY.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Get your FREE Copy of Ford's 1958 Booklet NOW!
How to select the proper equipment for FIRE FIGHTING
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PUBLISHED IN THE INTERESTS OF FIRE PROTECTION AND PREVENTION BY THE FORD Division of FORD MOTOR COMPANY

Be Sure You Get the Right Fire Fighting Equipment For Your Needs

MAIL COUPON NOW for your FREE copy of FORD's new 12-page booklet

Ford's new 12-page booklet tells you how to select the right truck for your particular pumping capacities and load requirements. Here in clear, simple terms are important facts you should know before you buy a fire truck.

For instance, there are specifications for Ford's completely new all-truck Super Duty V-8 engines. These big Ford V-8's easily supply the power and torque required to handle 1,000- and 1,250-GPM pumps. And only Ford offers you the economy and durability of Short Stroke design in *every* engine—V-8 and Six. Ford chassis with specialized bodies and equipment are also illustrated and there is a list of major fire equipment builders included.

Make sure you get your copy of Ford's 1958 fire equipment booklet. Remember, it doesn't cost you one cent—it's free. Simply fill in and mail the coupon today. Don't delay . . . do it now!

FREE—Mail this coupon today!

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Please send me your free 12-page booklet "How to Select The Proper Equipment For Fire Fighting."

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SEE THE FORD TRUCKS ON EXHIBIT AT THE INTERNATIONAL ASSOCIATION OF FIRE CHIEFS CONVENTION
Shrine Exposition Hall, Los Angeles, California, from September 15-18. Booths 69 and 70, Space "K"

COMPACT THREE-IN-ONE

REVIV-A-LIFE®

RESUSCITATOR-INHALATOR-ASPIRATOR

with improved Venturi Action control

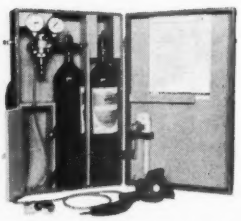
which eliminates spring and toggle mechanism and reduces service requirements

- **Unique Baer model control valves for single handed operation.**
- **Automatic change over from resuscitation to inhalation and back.**
- **Aspirator connected in readiness for instant use.**

- **Easy to carry—simple to use. Light weight—assembly on removable aluminum panel for ladders or tight places.**
- **Metal diaphragm — does not deteriorate.**
- **Unconditionally Guaranteed. Several models, including duals, are available.**

Numerous models of Inhalators to meet every requirement.

Inhalator No. 22 (formerly No. 331)



Ambulance Inhalator No. 82 (formerly 327)

Featuring one hand control valve—

Oxygen controls to regulate resuscitation or inhalation are in the patented control valve in the hand of the operator. This feature enables one operator to service a patient at any distance from the supply tanks. Important in excavations, cave-ins or inaccessible places.

The Reviv-A-Life Resuscitator is an automatic breathing machine which will rhythmically inflate and deflate human lungs within medically approved limits, safely. Many models to meet all requirements of fire, police, industry, hospitals, etc. Attractively priced.

Quality accessories and repairs for all makes at reasonable prices.

Sold through dealers and equipment manufacturers. Write for literature, prices and the name of your nearest dealer.

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OXYGEN EQUIPMENT & SERVICE CO.

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NEW...Lightweight...Improved...

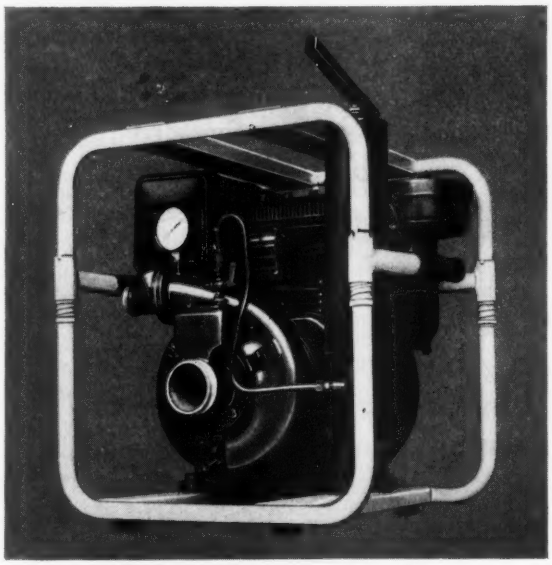
HALE Type FZZ and FZ portables

Meet the NEW Hale FZZ and FZ portable Fire Pumping Units. The famous FZZ was originated for fire-fighting by HALE . . . specialists in Fire Pumping Equipment. Often imitated but never duplicated, the FZZ and its companion unit, the FZ, are NEW in body, much lighter in weight and improved in design. Every Fire Company will find these Units "tops" in the emergency work for which each is specifically designed.

Here are just a few of the many plus features characteristic of both models

- NEW Aluminum Pump Body and Head.
- Either Unit weighs only 148 lbs., in frame.
- Available 3 ways: in frame as shown; on rubber-cushioned steel channels; or on two truck-type wheels for use in factories, mills, etc.
- Packing Gland of generous length, easily adjusted.
- Bronze Impeller mounted on Engine Crankshaft. The crankshaft is protected from corrosion and packing wear by a non-corrosive steel sleeve.
- NEW efficient Check Valve.
- Renewable Bronze Clearance Ring.
- NEW Improved Hale Ejector-Type Priming.
- Extra sturdy protective carrying frame with NEW rubber-grip handles. Handles fold out of the way in any direction, and lock in carrying positions. They also lock when folded inward as pictured.
- Painted in two attractive color tones—adds "Class" to any apparatus.

Type FZZ 2½" Suction and 1½" Discharge



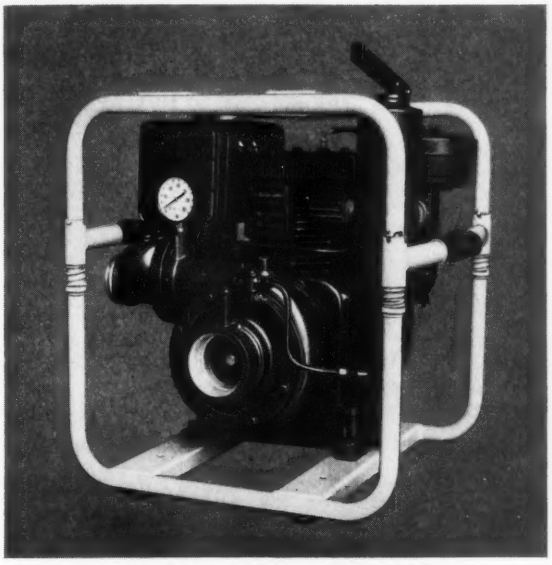
Packs a Pressure Punch!

The FZZ is best choice for a Company that frequently pumps thru a 2½" line over 350 ft. long from source of water not accessible to Major Pumper.

Supplies from Draft, on 10 ft. lift:*
60 U.S. GPM at 90 lbs.
80 U.S. GPM at 82 lbs.
100 U.S. GPM at 72 lbs.

*Based on level terrain

Type FZ 3" Suction and 2½" Discharge



Packs a Volume Punch!

The FZ is best choice for a Company that frequently pumps thru a 2½" line not over 350 ft. long from source of water not accessible to Major Pumper.

Supplies from Draft, on 10 ft. lift:*
85 U.S. GPM at 60 lbs.
150 U.S. GPM at 52 lbs.
300 U.S. GPM at 18 lbs.

*Based on level terrain

Write today for detailed information on FZZ and FZ to:

HALE FIRE PUMP COMPANY
CONSHOHOCKEN, PENNA.

• Fire pumps in all standard capacities.

Don't Overlook the Connecting Link

The connecting link between the private fire alarm system or sprinkler system and City Fire Department is the Master Box.

Your fire losses are beyond the curb line. And you aren't getting 100% value from your alarm system unless your city circuits are interconnected through the Master Box to industrial plants, schools and public buildings.

Protect yourself and your citizens *all the way*. Close up the gap. Remember, you depend on industry — it's up to you to protect it.

INTERNATIONAL ASSOCIATION OF FIRE CHIEFS

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VOL. 111, NO. 8

FIRE ENGINEERING

THE JOURNAL OF THE FIRE PROTECTION PROFESSION SINCE 1877

AUGUST, 1958

THE HOUR OF DECISION

Nobody inside or out of the fire service needs to be told these are perilous times. As this is written, the nation is on the brink of a shooting war that could conceivably end all wars—and most of us with it. Civil Defense is a "delusion and a snare." The pleas and recommendations of a nation's fire service for an intelligent plan and program in which the fire forces would receive more than lip service have been wasted on the desert air. The current hubub is for billions for shelters—and scarcely a buck for fire protection. It is frightening to believe what might happen if some hothead pulls the trigger!

This is the hour of decision for Civil Defense—and its relationship with the fire service.

Nobody will deny—least of all those who must administer the country's organized fire defenses—that on the economic and political fronts the "big business" of fire suppression is barely holding its own. Measured by current values, our "business" of fire suppression is running in the red to the tune of over a billion dollars a year (not to speak of the casualty list of over 11,000 deaths and a quarter of a million seriously injured)! But that's not all. To hold those losses to that regrettable limit, the nation's taxpayers are shelling out well over another billion for maintaining the twenty-odd thousand organized fire forces of the country. Ironically, with more fire fighters in more fire departments, manning more equipment than ever before in history, it is all we can do to keep abreast—let alone get ahead —of the demands imposed upon the fire service by multiplying population and business and industrial expansion.

In a word, the problems of fire protection, created by previously unheard-of developments in the fields of chemistry, nuclear fission, exotic fuels and synthetics, are multiplying faster than our fire forces, with all our vaunted facilities, can cope with them. If you question this, study the contents of this IAFC Conference and Buyers' Guide Issue of FIRE ENGINEERING. It is published to help answer the question "How is the Fire Service Measuring up to its Responsibilities?"

Aggravating this situation is the misdirected policy of civil administrators of our safety services to economize at the expense of our already badly undernourished fire forces. This economic constriction finds expression on an increasing scale in such weird and wondrous expediencies as integrating and merging municipal services, leasing out our vital fire fighting facilities which always have been, and should be, within the complete jurisdiction and control of the fire departments. It is aggravated by a policy that gives with one hand, and takes with the other; which agrees to shorter work periods for fire fighters—then reduces the number of personnel, and increases their duties and dangers—policies that consider only the economies and not the humanities of the job.

In fairness to the conscientious administrators and budget makers, let it be said they also have their headaches. They are answerable to a citizenry that is making excessive demands upon them for more services at less cost. The administrator's question is: "How can I improve working conditions for the firemen and other city employees and at the same time improve the organization's efficiency, so as not to appreciably increase the taxpayer's burden?

Perhaps that one word "efficiency" suggests the answer. That there is room for improvement in our fire suppression strategy and techniques, few will deny. One great weakness in our research and training at top level bids fair to be overcome with the launching of the International Fire Administration Institute. Progress, also is being made in the field of fire prevention as attested by the IAFCs successful home inspection program. We have made progress also in fire service communications, this in spite of noticeable lack of financial support.

Efficiency is a wonderful thing. But it takes more than the "will for the deed." If the fire service is to measure up to its responsibilities, it must have the necessary wherewithal. Adequate fire safety is not "bought in the bargain basement."

This is the hour of decision for the fire service—and for those responsible for its progressive development to meet the needs of the day—and the morrow.

Roi B. Woolley

Elements that Are Helping

The Los Angeles Fire Department To Achieve Its High Objectives

By DEPUTY CHIEF CHARLES W. BAHME
Director of the Bureau of Personnel & Training
Los Angeles Fire Department

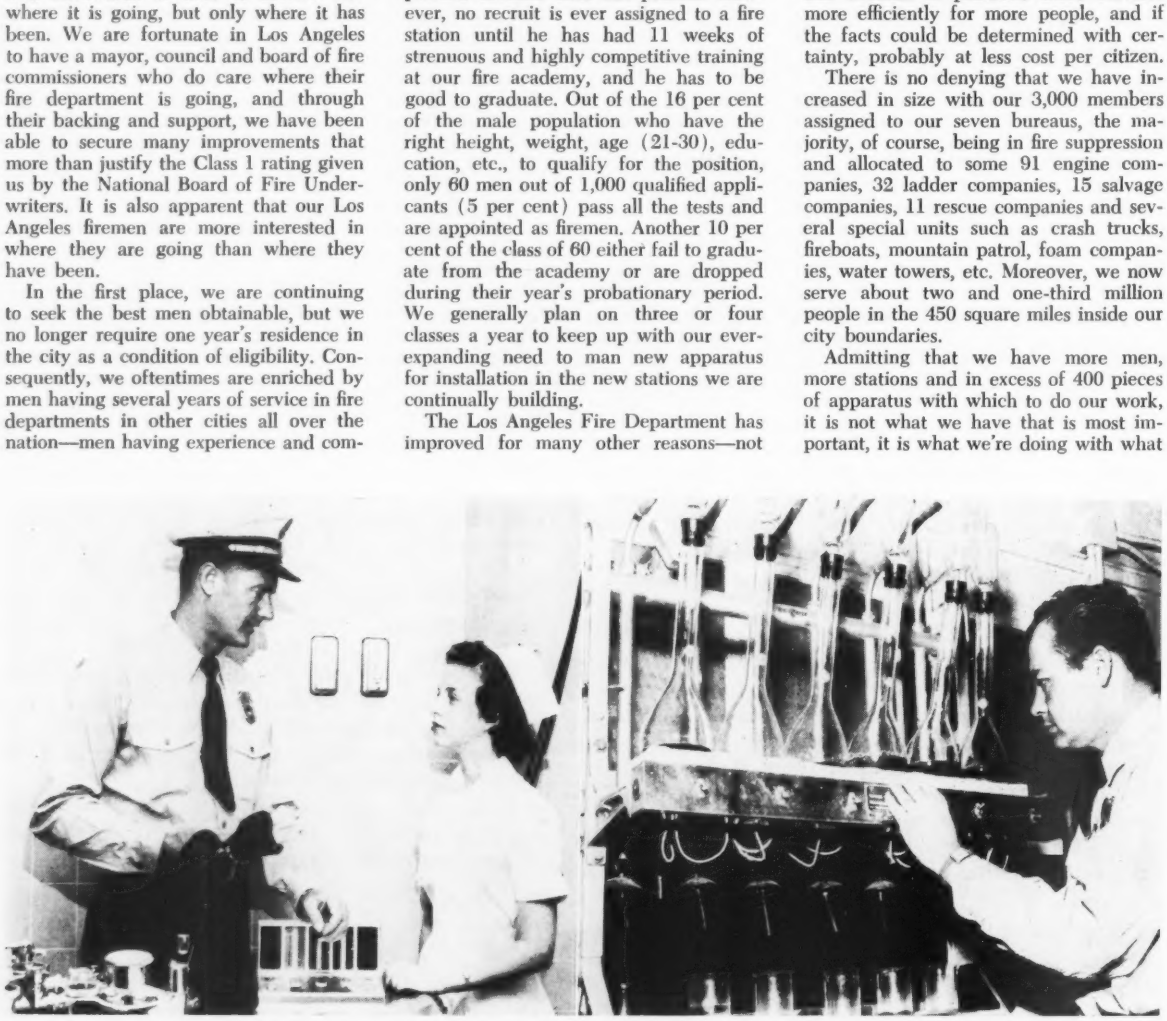
THEY SAY THAT THE DODO BIRD flies backwards because it doesn't care where it is going, but only where it has been. We are fortunate in Los Angeles to have a mayor, council and board of fire commissioners who do care where their fire department is going, and through their backing and support, we have been able to secure many improvements that more than justify the Class 1 rating given us by the National Board of Fire Underwriters. It is also apparent that our Los Angeles firemen are more interested in where they are going than where they have been.

In the first place, we are continuing to seek the best men obtainable, but we no longer require one year's residence in the city as a condition of eligibility. Consequently, we oftentimes are enriched by men having several years of service in fire departments in other cities all over the nation—men having experience and composure which the average newly appointed fireman does not possess. However, no recruit is ever assigned to a fire station until he has had 11 weeks of strenuous and highly competitive training at our fire academy, and he has to be good to graduate. Out of the 16 per cent of the male population who have the right height, weight, age (21-30), education, etc., to qualify for the position, only 60 men out of 1,000 qualified applicants (5 per cent) pass all the tests and are appointed as firemen. Another 10 per cent of the class of 60 either fail to graduate from the academy or are dropped during their year's probationary period. We generally plan on three or four classes a year to keep up with our ever-expanding need to man new apparatus for installation in the new stations we are continually building.

The Los Angeles Fire Department has improved for many other reasons—not because it has more men and equipment, but because it performs more services more efficiently for more people, and if the facts could be determined with certainty, probably at less cost per citizen.

There is no denying that we have increased in size with our 3,000 members assigned to our seven bureaus, the majority, of course, being in fire suppression and allocated to some 91 engine companies, 32 ladder companies, 15 salvage companies, 11 rescue companies and several special units such as crash trucks, fireboats, mountain patrol, foam companies, water towers, etc. Moreover, we now serve about two and one-third million people in the 450 square miles inside our city boundaries.

Admitting that we have more men, more stations and in excess of 400 pieces of apparatus with which to do our work, it is not what we have that is most important, it is what we're doing with what



Left: Fire prevention is a "must," with emphasis on inspections such as this being made at a local hospital. **Right:** New research laboratory is a definite asset. What is learned here may revise an entire extinguishing technique, or convict an arsonist—*All photos courtesy L.A.F.D.*

we have and how efficiently we are doing it that really counts!

Variety of services offered

The 20 million dollars the people of Los Angeles spent last year to keep us in operation was not merely to extinguish their 20,000 fires, but also to handle another 16,000 calls for help; these included about 4,000 requests for our regular rescue companies, mostly to alleviate various forms of asphyxia, and more recently about 8,000 calls for our new rescue-ambulances which now provide the only public ambulance service in the half of our city which comprises the San Fernando Valley.

In recent years our firemen have been making, in addition to their pre-fire planning inspections, a thorough fire prevention inspection of premises in their response districts—a service not rendered to the public a decade ago. To supplement this activity more than a hundred firemen in the bureau of fire prevention check industrial plants and conduct technical inspections of schools, hospitals, churches, public assemblages and other special occupancies. About half of them hold the title of senior inspector which they earned by competitive examination, a position which did not exist until last year. These men provide engineering and plan checking services to architects and contractors which only the professionally trained fireman can offer, and have access to our own library with its extensive reference works and research studies.

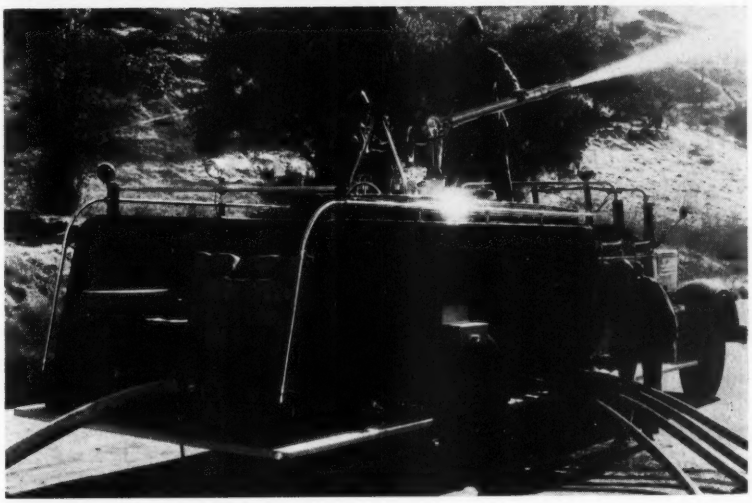
The firemen chemists in the bureau's new well-equipped laboratory provide a multitude of services to its arson and fire investigators, the latter also having recently been made a promotional position in our department.

For many years we have had a comprehensive junior fire department program, the graduate members now number over a half-million. In more recent years our plant protection unit has answered the requests of numerous industries to establish and train employee fire brigades, while our audio-visual unit continues to give hundreds of fire safety demonstrations, using spectacular mobile equipment and special station wagons, reminiscent of the old vaudeville days and every bit as good in showmanship.

One of the greatest advancements in fire prevention activity has been the preparation of a comprehensive fire prevention code, soon to replace the archaic ordinances which have had to be revised on a piecemeal basis for more than 40 years. It will also incorporate the experience-tested provisions from our dangerous chemicals code, a body of regulations which we prepared a few years ago to meet the difficult problems arising from the increased use of hazardous substances in industry.

Extensive training programs

Just as the training we give the new man today is more thorough than in the old days, so is the training for the other members. Our own aircraft crash fire



Company training includes operation of the latest type aircrash trucks (top) and heavy stream appliances such as this battery unit (bottom)

Audio-visual unit operates amid pleasant surroundings in its drive to promote good public relations

Men make fire departments and the Los Angeles Fire Department is choosy when it comes to selecting personnel. Here two of the neophytes get their badges

training, for example, is supplemented by a yearly appropriation for the special purpose of sending our officers and men from the commands in our two airports to Lowry Field in Denver, Colo., for two weeks of Air Force crash fire training. We are writing our own crash fire manual in the same way we developed our rescue-ambulance manual, through field conferences and expert outside assistance. In the latter case we called upon our receiving hospital doctors who not only gave us guidance, but participated in our formal training course. In like manner, we have sent our battalion chiefs to a supervisory training and instructors school conducted by our civil service department and have had them instruct all of our captains in these subjects during this past year. At the same time, all 60 of our chief officers, including the chief engineer, have been attending our command course in fire administration, in which we were very fortunate to have as our discussion leader for the various groups, a competent educator from the state department of education. Our deputy chiefs have also completed a 10-weeks' course at the University of California in personnel management during the past year, and funds have been requested in the next budget with which to pay the tuition in such courses for other chiefs.

All our companies have been given a brush fire refresher course this spring, and each member given a copy of the brush fire manual; our structural fire fighting training, carried out by burning down old houses in the path of the new airstrips and freeways, is still being carried on as more buildings are made available. We recently ran our high pressure companies through special drills using some 32 houses. We inaugurated another training program in driver instruction, with three captains from each of our four divisions (each having four or five battalions) receiving the initial training. When they have completed their course, they will use our new color training films on driving and tillering as visual aids and carry out a program of instruction in the field.

To back-stop the above program, we have on order a telebinocular machine and sufficient equipment to set up a psycho-physical testing lab where we can test for depth perception, eye dominance, tunnel vision, reaction time, etc., under the guidance of one of our firemen who has received his doctor's degree in the field of testing procedures. We plan to require all members to take these tests periodically and either correct any uncompensated defects discovered or discontinue driving emergency vehicles.

Company training

Our fire house drills now consist of much more than practicing manipulative skills such as hose layouts, ladder raising, knot tying, etc. In order for a company commander to keep up with training schedules now administered by battalion commanders, it is almost mandatory that a training session be conducted during every tour of duty, and to assist him there is available an extensive film library at each division headquarters, plus visual cast slides, speakers on special subjects, etc., which are gladly supplied or arranged for by our training section.

Our little booklet, "Fire Officer's Guide," now nearing completion, should provide a handy pocket reminder of suggested procedures for handling more than a hundred types of emergencies to which firemen are called. It should also provide many topics for training discussions on the various subjects covered, which include acid spills, baby deliveries, chemical fires, elevator emergencies, explosives, L.P. gas, refrigeration leaks, train wrecks, etc.

As pointed out previously, it is not enough to have better equipment, but we need better records, better methods, better communications.

Communications improved

We have made considerable progress also with all our fire fighting companies radio-equipped and work is under way to complete the installation of two-frequency equipment (now about half way along). We also plan to have a third frequency. The first frequency we use under ordinary conditions and the second for more effective exercise of command at major fires and emergencies. However, during the period in which we were combatting three major brush fires at one time last year, we could very well have used a third frequency because of the large volume of messages flowing from the four main transmitting stations, the three command posts, the multitude of mobile units on fire trucks, bulldozers, tank wagons, mountain patrol vehicles, to say nothing of the walkie-talkies carried by observers in helicopters and section commanders on the various fire lines.

As a further improvement of our communications, combination telephone and fire alarm boxes have been installed in the harbor area, offering a wider range of usefulness over the previous box system.

Nearing completion is our new mobile transmitter, a self-propelled, office-equipped, command coach, providing far superior facilities for command operations at major fires than do our alternative communications trucks. Perhaps in the future, we may obtain a portable TV camera for use by reconnaissance officers in helicopters and scout cars so that front-line fire conditions can be flashed back to the command post to supplement the radio description.

We now have teletype throughout the department—much of it operated by microwave, and we are investigating the possibility of using radio for vocal alarm dispatching in all of the stations in lieu of telephones.

Fireboats are equipped with radar for better navigation, and our headquarters has electronic data-processing machines to enable us to better keep and analyze our fire records, our inventory of firemen's skills, our accident reports, and such data as will enable us to carry out more successfully our new department-wide safety program, suggestion program and medical program. The latter are all tied in to reduce the time lost each year from preventable injuries.

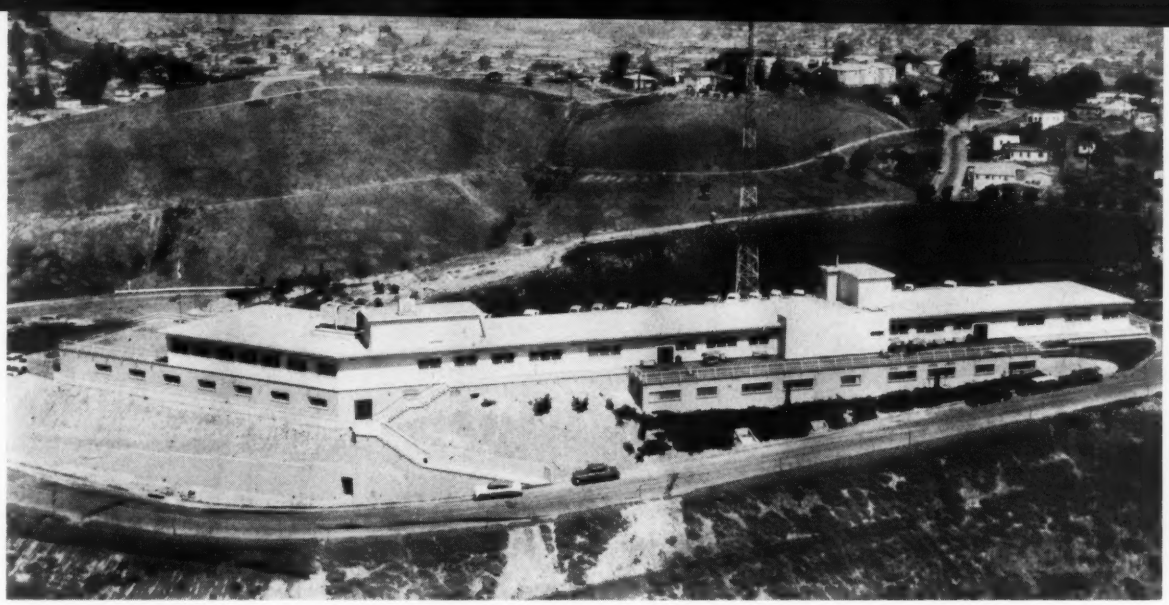
For example, as a result of an analysis of handball injuries, our captains' safety committee recommended to our chiefs' safety board that we provide eye guards for use at all our handball courts and require that they be worn. This has been done. In like manner, we are furnishing about 1,000 pairs of wide-vision goggles to all the companies in the battalions which respond to brush fires and we plan on furnishing every member with goggles and gloves as soon as practicable.

Construction program

Having acquired additional land adjacent to our existing supply and repair building, we are looking forward to the construction of a new well-designed supply and maintenance facility in which to relocate the modern tools and machinery undergoing acquisition, in order to maintain and repair all of our fire apparatus in keeping with the latest developments in fleet operation.

Continued on page 756

Mobile command post becomes general headquarters in time of serious emergency



Aerial view of the Los Angeles County Fire Department Central Headquarters in East Los Angeles area. New 14,000-square-foot addition is at left of structure, heliport is to left out of picture and training center is at right, also out of photo—*L.A. County F. D. photos*

Los Angeles County Fire Department—a Story of

PROGRESS and PROBLEMS

The largest county department in the world has triumphed over many obstacles—and faces the future with unbound confidence

By CLIFF DEKTAR

IF TWO WORDS could be chosen as representative of the Los Angeles County Fire Department today, they would be progress and problems.

The department continues in its most unusual status as the world's largest county fire department and the second largest fire department west of Chicago.

Actually, County Fire Chief Keith E. Klinger is the head of two departments—the Department of Forester and Fire Warden and the six County Fire Protection Districts. By a combined administration, training, communications and standardization of equipment, efficiency is improved and standards raised.

The department is also unusual in that it operates in 2,178 of the County's more than 4,000 square miles, providing services varying from high intensity protection in the East Los Angeles industrial district, to mountain patrol work in remote areas.

Chief Klinger feels the department has matured greatly during the past three years.

"We've had a chance to stop and take an introspective look at ourselves," the Chief says. "With the completion of the Cecil Royal Gehr Combat Training Center we completely revamped and expanded our training program. Today, every rookie is well-trained before he reports for field assignment; every captain and engineer has been through the center at least once for in-service training; all field companies have also been brought in for training at regular intervals.

"Our men are well paid, their working hours have been shortened, equipment has been improved and we are constantly striving to improve methods and equipment."

The County's phenomenal growth can be seen by these figures from FIRE ENGINEERING's 1955 series: Personnel, 1,505; 85 fire stations; two patrol stations; 98 engine companies with 121 pumpers; 24 mountain patrol trucks; 16 rescue companies; three truck companies, plus auxiliary units.

Today, authorized personnel exceeds 2,000; there are 99 stations—six new ones are under construction, 123 engine companies with 148 pumpers, 44 mountain patrol trucks, 17 rescue companies, four truck companies (two more will go into service this year and one next year), a 33-passenger bus, plus auxiliary equipment.

The budget for the current fiscal year is $22,000,000.

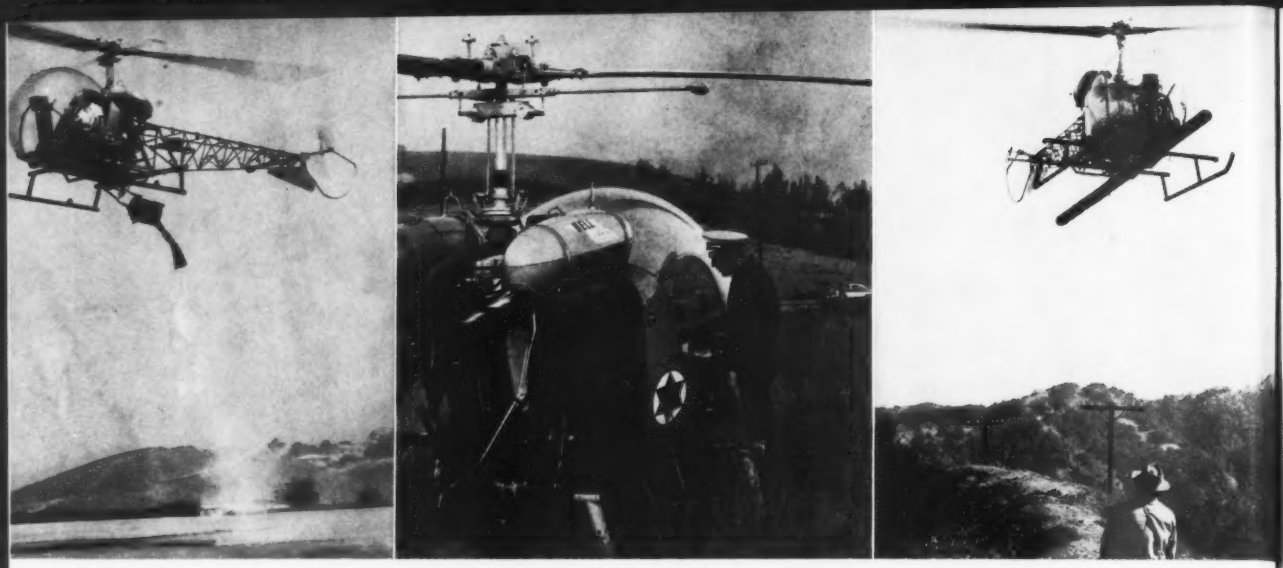
Compare this with 1945 when personnel numbered 1,153, there were 55 stations, five patrol stations, 64 engine companies with 69 pumpers, three rescues and a budget of $2,998,295.21.

The department now serves an estimated population of nearly 1,500,000 persons in unincorporated areas and 16 incorporated cities.

Last year the County added a new weapon to its fire control arsenal—a helicopter. The Bell 47G 'copter is equipped with a department radio. Additionally, two other sheriff's department helicopters are available for fire department use.

Just put into service is a helicopter tender truck which carries hose trays, helitanks, special jump suits, and other specialized equipment used in brush fire fighting.

The department has just designated its first air officer and published a 19-page



Left: Water jettisoned from Los Angeles County Fire Department helicopter during aerial tests. Department has own helicopter used on mountain fires and for reconnaissance on structural blazes. **Center:** L. A. County Fire Chief Keith E. Klinger (white cap) in sheriff's helicopter preparing for reconnaissance of big Malibu fire (background). **Right:** A new use for L. A. County Fire Department's helicopter was hauling telephone poles for use in inaccessible areas. Engineers reported many days and man hours saved using 'copter to bring poles into position

booklet on helicopter operations and policy.

The helicopter has been found useful in reconnaissance and size-up on large structural fires, too.

"I have flown over several large structural fires," reports Deputy County Fire Chief John W. Duncan. "The perspective is exceptionally good. I foresee and predict growing use of helicopters for this type of work."

Of course, L.A. County continues its close cooperation with the U. S. Forest Service, State Division of Forestry and University of California in working out new helicopter and aerial fire fighting techniques for brush and mountain control.

Also in the field of aviation, this year the County has gone into the aircraft crash protection field. Within the next two years it will put its first fireboat into service and then will have land, sea and air arms under its direct control.

Truely, a three-dimensional fire department!

Crash Co. 111 is temporarily operating out of Station 85 to protect the Brackett Airport for light planes in the eastern part of the county.

Crews for Crash 111 were trained by Captains Robert Robb and Willie Sutton of the County. Both men were well-equipped for their training. Robb is the chief warrant officer in charge of crash and rescue services for the California Air National Guard's 146th fighter wing at Van Nuys and M/Sgt. Sutton is his assistant.

Ground has just been broken for the William Fox Airport north and west of Lancaster in the Antelope Valley, some 80 miles north of the civic center. This major airport will have 12,000-foot runways and will be equipped to handle jet transports. A modern crash truck plus a tanker will be stationed here.

Now under construction at Playa del Rey south of Venice is a multi-million dollar Marina small boat harbor. The fireboat and a land-based "triple" will be stationed here.

Three new rescue trucks have just been placed in service. The rigs, built in County shops, are one-ton trucks with dual rear wheels and have compartments opening on the outside for rapid access to equipment. When the old vehicles wear out, the bodies can be transferred to new trucks. The County has been using half-ton panels for rescue work.

Also, put into service last year were two four wheel drive 500-gallon tank rigs for mountain work.

"We have found these highly mobile 'hot shot' rigs to be very successful in getting into heretofore inaccessible-to-vehicle areas and we have two more on order," says Chief Klinger.

Radio expanded

In the communications field, microwave links have been completed for two remote transceivers in the Rolling Hills and San Dimas areas to close two radio blind spots. A new dispatching center has been built at Battalion 6 headquarters in Newhall, and additional use of microwave is contemplated. Thirty-eight stations now have selective calling equipment for dispatching. When new stations are constructed in the areas served by selective calling, additional installations will be made.

The department hopes to obtain another radio frequency soon on the 150 mc band to ease its severe overload.

Last year a 14,000-square-foot addition was completed to Central Headquarters. This project will be finished soon with completion of the new central dispatching center.

L.A. County today is organized into three field divisions with 11 battalions and this fire fighting services division is headed by First Assistant Chief Roland Perçey.

A research and planning division was activated July 1 with Assistant Chief Lathon Brewer in command. He will su-

Malibu blaze of 1957 out of control threatens L. A. County fire equipment. Hundreds of feet of hose were lost, but no apparatus was destroyed

pervise research and planning and the two battalion chiefs who coordinate work with the 16 incorporated cities.

The department continues to have excellent public and press relations with Public Information Officer Robert C. Singleton in charge of this service. Singleton responds to all major alarm fires to assist the press, radio and TV in obtaining information.

The fire prevention bureau has been expanded and the junior fire department program continues to grow. A complete fire testing laboratory is in operation under Captain Milan Priest. It is housed in the training center.

A full-time fire investigator has been added to the staff, as well as a headquarters captain who serves as personal services officer.

Performance evaluation

Miss Alene Kent, an illustrator, has just been added to the staff and the department will greatly expand its visual and training aid program.

What should be one of the most significant achievements to the general fire service is the new performance evaluation program. This system of efficiency reports is designed for the first time specifically for the fire service.

"I have for some time believed that a performance evaluation embracing standards specifically designed for fire personnel should result in a renewed interest in the over-all improvement program," says Chief Klinger.

"Our new form and guide—evolved by an all-ranks committee in conjunction with the civil service commission—at last gives supervisors an effective tool for planning and scheduling work loads, while giving employees specific and realistic goals for improvement. It permits the establishment of mutual understanding and allows for frequent appraisal and discussion.

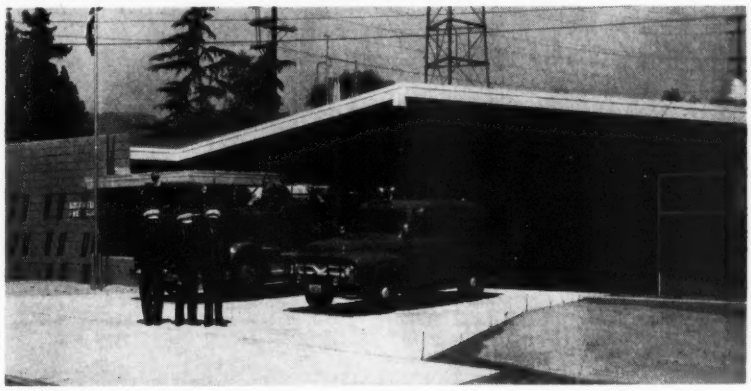
"Regular use in house drills and group discussion of the standards outlined in the form should tend to heighten good relations between the supervisor and his subordinates."

Chief Klinger adds that the new system will be used for all ranks from fireman to battalion chief, but administrative personnel will continue to be rated by the existing standard county system.

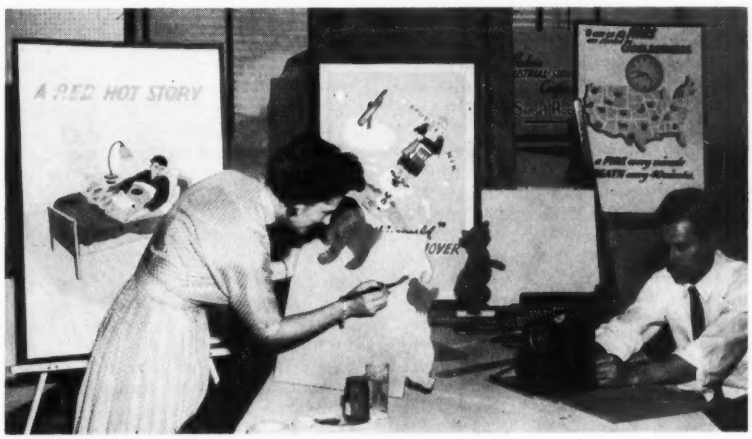
Training officer, Chief George Brunton, who was instrumental in preparation of the evaluation manual, points out the key to the program is the clear cut standards set forth and linked to each evaluation.

"Using these standards, we hope to make our ratings as uniform as possible no matter how many different officers a man serves under," said Chief Brunton.

General headings are station work, drills, emergency work, fire prevention, public relations and supervisory ability—where applicable. Ratings of outstanding, competent, improvement needed and unsatisfactory are noted merely by an X in a box. Additional space is provided for comments.



One of the Country's new fire stations in La Canada area. Station 82 is Battalion 4 headquarters and houses three regular engine companies, two patrol trucks, plus reserve equipment



Alene Kent, L. A. County's new staff artist and illustrator works on fire prevention and visual aid material. Fireman Bill Jordan detailed to work with her in the new job looks on

Los Angeles County Fire Department's new all-wheel drive "hotshot," Engine 282, for use in inaccessible mountain areas. Rig carries 500 gallons of water and small hose. Two are in service, two more on order

Mutual aid problem met

One of the major problems L.A. County has is mutual aid.

"We will help any department any time we can," bluntly states Chief Klinger.

Last year the County sent aid 501 times and received assistance 278 times.

The County has dispatched men and apparatus in mountain fires up to 125 miles away, including assistance to Santa Barbara County several years ago when a major brush fire threatened the Channel City itself.

The department maintains formal mutual aid agreements with 33 cities, U. S. Forest Service, Ventura and Kern Coun-

Continued on page 761

Another in the Series of Chemical Studies

A SURVEY OF ROCKET PROPELLANTS

By PAUL F. DeGAETA* and ARNOLD A. WEINTRAUB**

This survey is merely the introduction to the subject of rocket propellants. It is not a study that will of necessity affect every one involved in fire protection, but the time is here to start your file. Undoubtedly, new techniques or extinguishing agents will be developed to improve our present knowledge. It is fervently hoped that this will come about as a result of successful research rather than information gathered in the ruins of future holocausts.

ROCKETRY, like many new developments on the scene, poses a problem in fire protection. The fuels employed in the propulsion of these most modern of vehicles possess inherent flammability and explosibility characteristics that require a consideration of top priority.

Keeping informed on the innovations in this field is a task of major proportions. Events move so swiftly that it is as important to consult the daily press as the basic references.

When the Navy's Vanguard I kicked off its launching pad at 7:15:41 a.m., March 18, 1958, the firing ended months of frustration and the three-stage rocket set its satellite in orbit with the power of a variety of fuel and oxidizer combinations.

The first stage utilized kerosene for the basic fuel and liquid oxygen as the oxidizer. Both tanks were pressurized by helium to prevent spasmodic starvation of the fuel chamber and each ingredient was pumped into the combustion chamber by high pressure steam generated by the decomposition of hydrogen peroxide.

The second stage, which boosted the speed from 3700 to 9000 miles per hour, was fueled with unsymmetrical dimethylhydrazine and white fuming nitric acid. It was a leak in the nitric acid line that prevented a previous attempt from successfully orbiting the satellite.

Two small solid propellant rockets, mounted perpendicular to the direction of travel, fired as designed, giving the third stage a spinning motion to maintain directional stability. Then two similar "retro" rockets produced a thrust opposite the direction of travel to separate the second stage from the third, which, powered by a solid propellant also, proceeded to attain the 18,000 mile-per-hour speed required to complete the mission.

In order to consider the fuel in proper perspective, it is important to observe its function in relation to the entire device. As in many new inventions, the reaction motor is a new application of an old principle. A long time ago Newton recorded his laws of motion, one of which states, "Every action has an equal and opposite reaction." Gases generated under high pressure as a result of fuel combustion push out of the rocket's open end to supply the action. The body of the rocket is forced away from the expelled gases in the "reaction" phase of the phenomenon, measured in pounds of thrust.

While in the basic principle the rocket and jet plane are related, there are differences. The jet operates on a fuel that requires oxygen for combustion. The rocket or reaction motor carries as part of its chemical propellant an oxidizing agent that makes it independent of any external supply of oxygen. This variation is of paramount importance and accounts for the fact that the jet plane is limited to operation within the earth's atmosphere. On the other hand, the rocket is not confined to lower space boundaries. By virtue of self-contained design, it can operate in the outermost regions of space and attain any altitude or position in the universe to which fuel is capable of propelling it.

It is interesting to note the difference between a rocket and a missile. A rocket is utilized for any non-military purpose such as transportation or gathering scientific data from outer space. The missile is a rocket, the sole purpose of which is to carry an explosive warhead to a military target. When the missile contains a system, either self-contained or operated from the ground, to direct the target approach, it is known as a "guided missile." A "ballistic missile" has its direction and target set before firing and once in flight continues on its trajectory subject to the influence of winds, pressure, temperature and other atmospheric conditions.

The rocket motor is in essence a heat engine which converts the chemical energy of propellants into heat and the heat into motion. The thrust achieved by the rocket motor is developed in proportion to the exhaust velocity of the reaction products. To generate a high exhaust velocity, the reaction propellants must yield a large quantity of heat per unit mass and this accounts for the use of the lightest elements as propellants.

Aluminum, lithium and magnesium are among the favored metals. Carbon and boron are desirable non-metals. Oxygen, hydrogen, fluorine and nitrogen are also on the list of those chemicals that satisfy the required criteria. By incorporating high energy configurations such as $-C\equiv C-$, $>N-N<$, and $-O-O-$ in

Liquid Propellant Combinations

Oxidizer	*Fuel*	*Mixture ratio lb. oxidizer per lb. fuel*	*Theoretical combustion Temp. F.*	*Bulk Density*	*Specific Impulse*
Chlorine trifluoride	Ammonia	3	4980	1.26	240
Fluorine	Diborane	5	7880	1.07	310
Fluorine	Hydrazine	2.0	7740	1.30	316
Fluorine	JP-4	2.6	7100	1.19	282
90% Hydrogen Peroxide	Hydrazine	1.9	4170	1.20	253
Red Fuming Nitric Acid	Turpentine	4.2	5400	1.36	237
Red Fuming Nitric Acid	JP-4	4.1	5150	1.30	238
Red Fuming Nitric Acid	Unsymmetrical Dimethylhydrazine	2.6	5200	1.23	250
Oxygen	Nitroethane	0.65	5570	1.09	253
Oxygen	Nitropropane	0.9	5620	1.06	257
Oxygen	JP-4	2.2	5880	0.98	264
Oxygen	Hydrazine	0.70	5370	1.06	282
Oxygen	Unsymmetrical Dimethylhydrazine	1.3	5460	0.96	276

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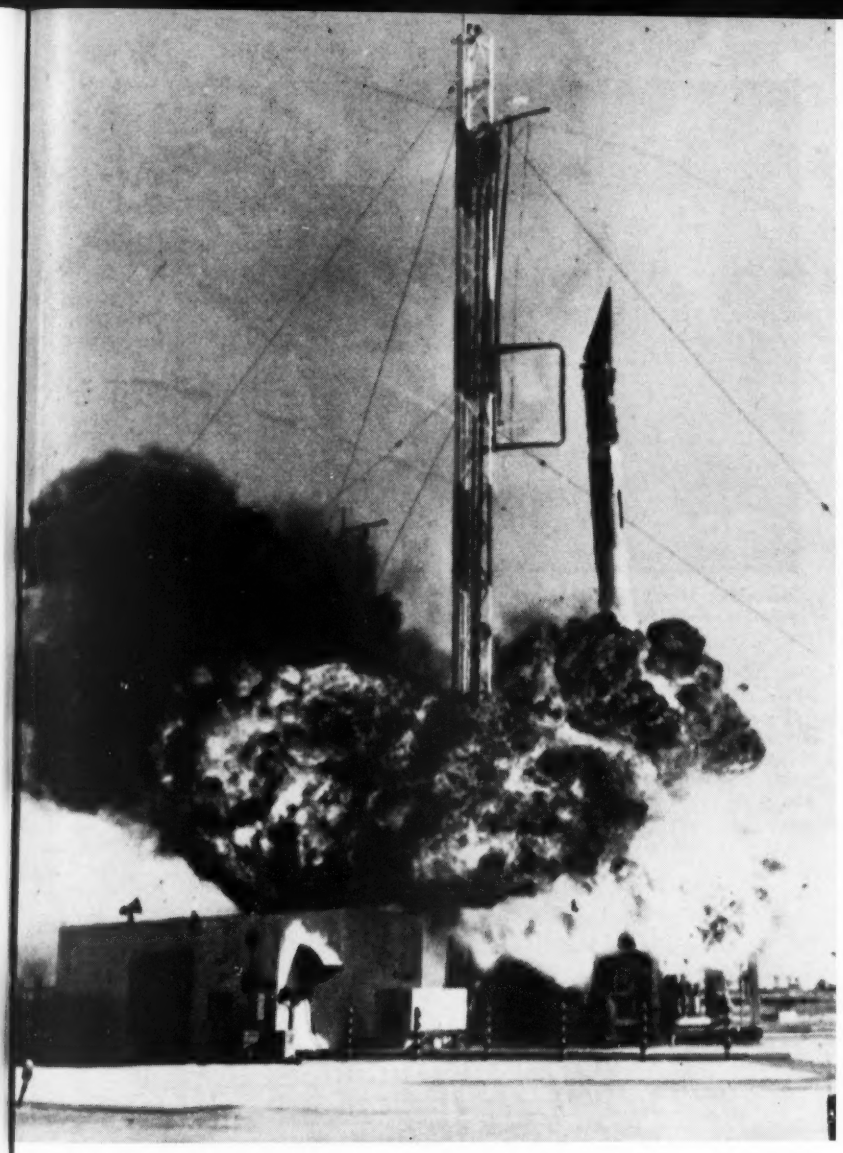
**Captain, FDNY; Lecturer in Chemistry, Queens College, N. Y.



Navy Vanguard rocket explodes on launching pad at Cape Canaveral, Fla., during unsuccessful attempt to launch space satellite into orbit—*U. S. Navy photo*

combination with other elements, the heat yield is greatly enhanced.

Once the propellant has produced its maximum heat, the efficiency with which it is converted into motion is dependent upon the molecular weight of the exhaust gases. The lighter the products of combustion, the greater the energy yield. Therefore an attempt is made to develop propellants giving off such light products as hydrogen, carbon dioxide and water vapor. While no one propellant will have maximum rating in all characteristics that develop the highest efficiency, in addition to stability and high density, research is directed toward developing propellants with the optimum balance of properties.

Fuels and oxidizers

Classification of propellants sets apart fuels, oxidizers and monopropellants. The bipropellant system, a combination of a fuel and an oxidizer, is used in the majority of propulsion systems. A monopropellant is a single liquid or mixture of substances that contains all the necessary ingredients to generate the required energy.

There are also two major groupings that are resolved into liquids and solids. Each has its own advantages and disadvantages. Liquid fuels give greater energy but require more intricate accessory equipment in the nature of piping, nozzles, ignition and pumping devices. The mechanical components are subjected to severe stresses and strains due to the high speeds and temperature variations. A major flaw that plagued three long-range missiles, Thor, Jupiter and Atlas, was traced to a pump that delivers fuel and liquid oxygen to the combustion chamber. Redesigning the parts to correct burrs on one pump gear and a weak spline shaft on which it turned resulted in satisfactory performance.

Solid fuels are more easily handled, necessitate few moving parts and eliminate many of the objections to liquid propellants. As if in compensation for this advantage, however, the solids have a much lower energy yield and are used for smaller vehicles in the present state of development. The fuel and oxidizer are intimately mixed. In some cases the fuel is a binder for the crystalline oxidizer, while the nitrated type of propellant has the oxidizer chemically linked to the fuel. Ammonium nitrate and potassium chlorate have been used as oxidizers mixed with a variety of thermoplastic or thermosetting plastics as the combination fuel and binder. Among the criteria that dictates the use of one solid propellant in preference to another are the energy released per unit weight and volume, burning rate and variation with temperature and pressure, ease of ignition under control, accidental ignition potential, property changes in storage and method of installing propellant in rocket motor.

Considering the advantages of solid fuels, the trend is definitely toward increased application as their energy level is improved. An estimate, among some leaders of the nation's missile program, highlights the likelihood of the solid propellant missiles, Polaris (Navy-sea based) and Minuteman (Air Force-land based), taking over the bulk of the nation's defense by 1965.

Among fuels that have been investigated are liquid ammonia, ethyl alcohol, aniline mixtures, hydrazines, hydrogen and various petroleum products and derivatives. In the category of oxidizers are liquid oxygen, fuming nitric acid, fluorine, chlorine, trifluoride, ozone, ozone-oxygen mixtures and concentrated hydrogen peroxide. As monopropellants, ethylene oxide, hydrazine, hydrogen peroxide and nitromethane have been used. With the exception of ethylene oxide, the monopropellants named can also be used as a fuel or an oxidizer. Although some of these names are familiar, they are loaded in such high concentrations that ordinary handling and precautionary measures are inadequate.

One measurable reference, specific impulse, is common to all propellants and a fundamental basis of comparison. By definition, specific impulse is thrust in pounds, obtained from chemical reaction of a pound of mixture per second and the unit is pounds per pound per second. Propellant volume is also of great significance and specific impulse multiplied by bulk density is another piece of data upon which selection is based. In the table on the preceding page is listed a number of propellant combinations with some important characteristics of each.

JP-4—a modern jet fuel

JP-4, used in a number of rocket propellant systems, was originally a fuel for jet-propelled military aircraft. It is a blend of gasoline and kerosene containing a wide variety of hydrocarbons and as such has no one specific chemical formula. Flash points range from 30 to as low as −10 degrees F. and ignition temperatures from 485 to 625 have been

recorded. For all practical purposes it should be considered as having the same hazards as gasoline and handled accordingly. Where foam is provided for other petroleum product storage tanks, the American Petroleum Institute recommends that it should also be made available for protection of JP-4. Relatively non-conducting, generation of static electricity will depend on turbulence during transfer and presence of finely divided conductive impurities such as rust or water. Because JP-4 is more viscous than gasoline, it will tend to hold the impurities in suspension longer and is therefore more susceptible to static generation. Once the suspended materials have settled, however, the tendency toward inducing a static charge is the same in both liquids.

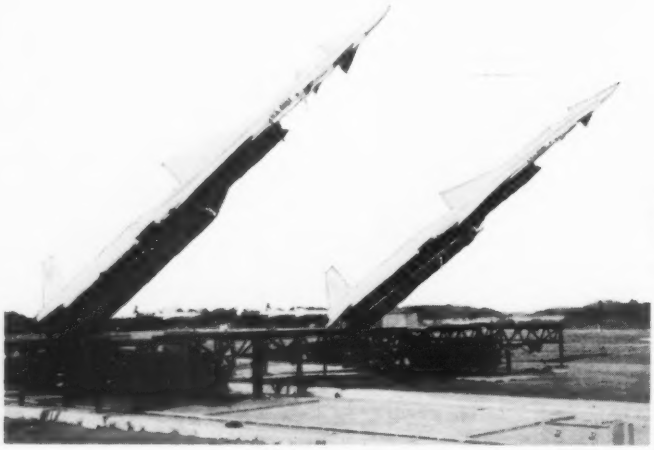
Worcester, Mass., firemen control flames involving wreckage of a jet plane and three dwellings sprayed with blazing fuel when plane crashed into residential area

Fluorine

The most powerful oxidizing agent known, fluorine reacts with most substances, often accompanied by ignition. Liquid fluorine spills can be rendered harmless by neutralizing with sodium bicarbonate applied from a dry powder type of extinguisher. This form of application is also effective in extinguishing any fire caused by the contact of fluorine with a combustible substance. Water is not recommended for use on fluorine. A violent reaction results with the generation of hydrogen fluoride which is almost as dangerous as the fluorine itself, although it will not support combustion.

Fluorine is one of the oxidizing agents successfully used with a variety of fuels. Its combination with fuels had to be curtailed for some time because of the difficulty in handling and shipping. Formerly, shipping restrictions limited the contents to 6 pounds of fluorine in a 200-pound cylinder under 400 pounds of pressure. This uneconomical ration of 1 pound of gas to 33 pounds of container sharply restricted its use until Allied Chemical and Dye Corporation developed a practical tank system permitting bulk storage and shipment of liquid fluorine under ICC approval.

The unique tank system containing no moving parts or mechanical refrigeration took over two years to develop. It consists of three horizontal tanks, one inside the other. The fluorine is maintained in a liquid state in the center tank by liquid nitrogen in the second which is sur-



Left: Army anti-aircraft missile Nike-Ajax is liquid-propelled and carries high explosive warhead. **Below:** Nike-Hercules solid propellant missile which will replace Ajax. It can carry thermo-nuclear warhead—*U. S. Army photos*

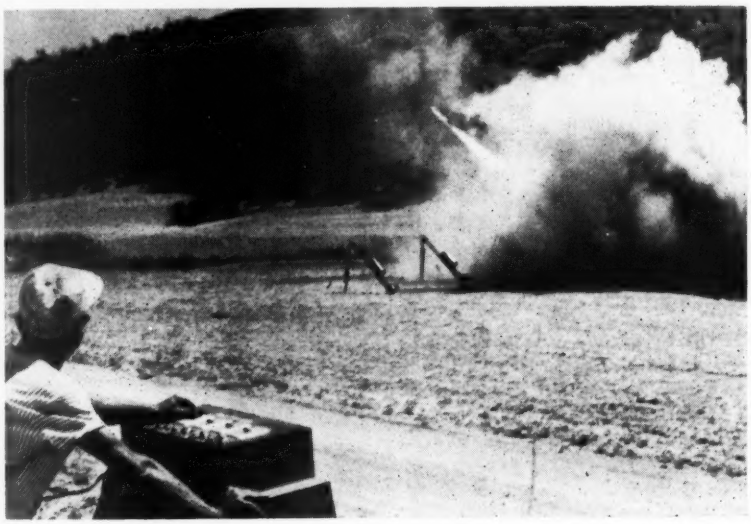
rounded by an insulating shield in the space between the second and third tanks. Liquid nitrogen boils at −320 degrees F., 14 degrees below the −306 degrees F. boiling point of liquid fluorine. The temperature difference maintains the liquid fluorine in a condition free from any pressure rise as long as there is liquid nitrogen in the second tank and the insulating shield is so efficient that nitrogen losses are maintained at a very low level. This system can be used for bulk storage, trailer or railroad car transportation.

Hydrazine

Hydrazine, an extremely active substance with the formula H_2NNH_2, fueled the German rockets that were used in the closing days of World War II. The four hydrogen atoms are quick to unite with an oxidizing agent in chemical combustion. With a lower explosive limit of 4.7% by volume in air, it varies from other fuels because there is no upper limit to the explosive range and it will dissociate with explosive violence in 100 percent concentration. Flash point varies with concentration of the liquid from 126 degrees F. for a pure hydrazine to 235 degrees F. for 40 percent hydrazine-water solution. Ignition temperature is 518 degrees F. Utmost care in handling is essential to prevent contamination with decomposition catalysts such as iron, molybdenum and copper oxides which can cause spontaneous ignition. Ignition will also occur when hydrazine is exposed to the atmosphere on porous substances such as asbestos, carbon or iron filings. Large quantities of water are recommended for extinguishing fires involving hydrazine.

Unsymmetrical dimethylhydrazine

Unsymmetrical dimethylhydrazine $(CH_3)_2NNH_2$, is similar in many respects to hydrazine from which it is derived. With widely separated flammability limits of 2.5 percent to 95 percent by volume, a flash point of 34 degrees F. and an ignition temperature of 482 degrees F., it possesses a high hazard potential and like hydrazine is stored under nitrogen. For all practical purposes a flammable mixture is present whenever it is exposed to air. UDMH, as it is abbreviated, burns cleanly and smoothly. Application of large volumes of water achieves both extinguishment of a UDMH fire and a dilution effect. Two or more volumes of water to one of UDMH is sufficient to extinguish a fire involving it. While a higher concentration in water will support combustion, the flame intensity can be observed to diminish as dilution occurs. Carbon dioxide is an effective extinguishing agent but standard and alcohol-type foams are unsatisfactory due to deactivation of the foam-forming surfactant.



Engineers fire rocket-powered fire extinguishers carrying borate solution in warhead during tests to determine their possible use in fighting inaccessible forest and brush fires

Hypergolicity is the characteristic of spontaneous ignition on contact of a fuel and oxidizer. The hypergolicity of UDMH and fuming nitric acid makes it an outstanding rocket fuel. Having the shortest ignition delay of any known combination, this system spontaneously ignites in only a few thousandths of a second.

Addition of UDMH to other systems gives reliability to an otherwise nonhypergolic combination. The Army "Nike-Ajax" missile makes use of this principle. A JP-4 with small amounts of UDMH, is designated as M-3, and used with red fuming nitric acid. The fuel is supplied in premetered tanks to preclude the disadvantages of transfer from bulk storage. The twisted wreckage of launching platforms and the death of 10 men at Middletown, N. J., missile base on May 22, 1958[1] attests to the damage that can be done when a system gets out of control. Eight Nike-Ajax missiles exploded on the ground and scattered debris three miles from the 526th Missile Battalion installation.

Hydrogen peroxide

Hydrogen peroxide (H_2O_2), a strong oxidizing agent, is most usually employed in 90 percent concentration for propulsion applications in this country and can be utilized either as an oxidizer or a monopropellant. While this is a high-energy material requiring systematic care in handling, it lacks the hazard of volatile flammable liquids because it presents no hazard in the presence of a spark.

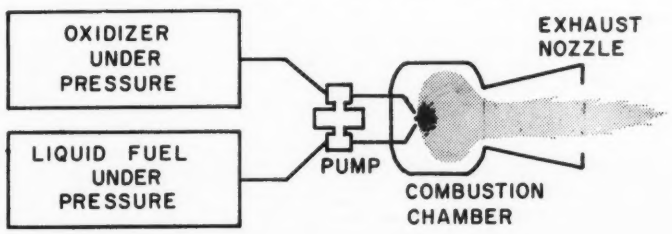
The dangerous features of hydrogen peroxide include possibility of fire when spilled on clothing or combustible materials. Neither Dynel nor Dacron fabrics, however, ignite on exposure to this oxidizer. Any fire caused by hydrogen peroxide and ordinary combustible materials can be extinguished by water. Water will also dilute any spill and reduce the oxidizing potential to the point where it will prevent ignition on contact with combustible material.

Testing for detonation sensitivity by a number of laboratories has revealed little likelihood of explosion. Contact with a soluble organic substance, however, can lead to an explosion by creating a condition comparable to a hydrocarbon and air mixture. Alcohols, glycols, acetates, acids and ketones combined with 90 percent hydrogen peroxide result in a highly explosive solution. It also forms explosive mixtures with gasoline, kerosene, petroleum ether and fuel oil.

Continued on page 763

[1]Fire Engineering, July, 1958

Simplified diagram of a liquid fuel reaction engine



Fire hose is subject to abuse in major fires such as this Washington, D. C., lumber blaze, as apparatus responding on multiple alarms must often ride over charged and uncharged hose lines
—*Photo by William S. Telep*

What Fire Chiefs Prefer in Fire Hose

FIRE ENGINEERING presents the trends and indices of this foremost essential of fire protection. Report based upon factual data supplied by over 600 representative fire departments

A SPECIAL STAFF REPORT*

OVER THE YEARS FIRE ENGINEERING has been known for its factual studies of fundamentals of the nation's fire service. These studies have been widely quoted and used by government, municipal and private agencies as well as by civil service, educational and other authorities. Their authenticity has never been challenged, primarily because the basic data for the reports comes from unchallenged sources—the nation's foremost fire fighters.

This is the first FIRE ENGINEERING research study into the question of fire hose in over two years. In the interim there have been a number of surveys into the subject, most of which were limited in extent and findings. Nor were any of them as detailed in subject matter as the following.

* *Special acknowledgment is made of technical assistance of the Market Research Section, Textile Fibers Dept., E. I. duPont de Nemours & Co., in analysing this data.*

FIRE ENGINEERING takes this occasion to thank the hundreds of fire chiefs who so generously provided the essential data for this study. More than 600 departments in places of over 10,000 population returned answers to the 21 questions asked and these reports formed the basis for the following conclusions presented in this report. Nearly 100 respondents in communities under 10,000 also provided valuable data but for convenience, the findings of this last group will be reported in a later and separate study which it is expected will be made shortly.

The following table shows the percentages of fire departments represented in the survey on a population and manpower basis. In succeeding tables a population category will be referred to by the key letter appearing in brackets.

Geographically the distribution of fire

Key	*Community Population*	*Percentage Responding*	*Type of Department*		
			Full Paid	*Part Paid*	*Volunteer*
(A)	500,000 and over	80%	100%	—	—
(B)	250,000–500,000	80%	100%	—	—
(C)	100,000–250,000	60%	96%	4%	—
(D)	50,000–100,000	63%	94%	5%	1%
(E)	25,000– 50,000	66%	77%	22%	1%
(F)	10,000– 25,000	28%	46%	48%	6%

departments in this country and the percentage of returns from each area is as follows:

Geographical Area	Percent of Departments	Percent of Returns
New England	16	10
Middle Atlantic	32	12
East North Central	17	25
West North Central	6	5
South Atlantic	9	12
East South Central	2	5
West South Central	5	8
Mountain	3	6
Pacific	10	17

The estimated total amount of hose maintained by the fire departments represented in the above is 6,900,000 feet of 1½-inch; 19,900,000 feet of 2½-inch; and 900,000 feet of 3-inch. Some departments in this country use 2¾-inch hose and this is included in the 2½-inch total for convenience. About 67 per cent of all fire hose is treated to resist mildew.

The average stocks of hose in service (on apparatus) per individual department and the reserve supply maintained as well as the total estimated supply for each group to the nearest 5,000 feet are shown in the table at the right.

		1½-inch	2½-inch	3-inch
(A)	dept. – in service	32,500	94,100	21,800
	dept. – in reserve	31,300	74,800	9,600
	total US – service	670,000	1,940,000	395,000
	total US – reserve	520,000	1,250,000	160,000
(B)	dept. – in service	12,000	45,400	1,900
	dept. – in reserve	6,700	18,000	1,900
	total US – service	290,000	1,105,000	35,000
	total US – reserve	130,000	390,000	20,000
(C)	dept. – in service	7,300	27,700	1,500
	dept. – in reserve	3,800	11,700	1,600
	total US – service	540,000	2,050,000	80,000
	total US – reserve	230,000	765,000	30,000
(D)	dept. – in service	3,900	13,400	700
	dept. – in reserve	2,500	7,200	600
	total US – service	520,000	1,875,000	65,000
	total US – reserve	255,000	790,000	5,000
(E)	dept. – in service	2,300	7,800	400
	dept. – in reserve	1,700	4,300	500
	total US – service	1,185,000	2,205,000	50,000
	total US – reserve	365,000	1,030,000	15,000
(F)	dept. – in service	1,600	5,000	200
	dept. – in reserve	1,300	3,000	200
	total US – in service	1,350,000	4,350,000	40,000
	total US – in reserve	810,000	2,235,000	5,000

Synthetics increasingly popular

Judging from the answers to a question concerning the use of hose containing filler cords of Dacron polyester fiber or nylon in combination with cotton warp it is evident that these modern synthetic fibers have made a strong penetration of the field in competition with the all-cotton. This is remarkable when it is recalled that these synthetic fibers have been used in fire hose only a few years.

Fire chiefs answered the query as follows: 63 per cent use both all-cotton hose and Dacron and cotton hose; 25 per cent use all-cotton exclusively; 4 per cent use Dacron and cotton exclusively; the remaining 8 per cent of the replies are divided among those that use all three types or nylon and cotton exclusively.

When asked to state their preference for a particular type of jacket construction, 68 per cent said they preferred the Dacron and cotton jacket; 17 per cent prefer all-cotton; 5 per cent prefer nylon and cotton; 10 per cent specified no particular choice.

The above statements should not be construed as comparing the relative merits of one synthetic fiber against another. Even though the figures show one fiber more widely used it must be borne in mind that of the 13 manufacturers of municipal fire hose only one up to the present time, supplies nylon and cotton jackets; this same manufacturer also produces Dacron and cotton jacketed hose.

Only 53 per cent of the chiefs presently using all-cotton hose stated they preferred to continue buying the natural fiber and most of these had no experience with hose containing synthetic yarn. On the other hand only 5 per cent of those presently using hose containing the man-made fiber stated they preferred to buy all-cotton.

Records kept

Hose records are kept by 84 per cent of the respondents. The information most frequently recorded includes purchase date, 94 per cent; size of hose, 91 per cent; manufacturer, 85 per cent; brand, 82 per cent; test pressure used, 82 per cent; date placed in service, 80 per cent; and service life, 74 per cent. Additional information included by many concerns double or single jacket construction; type of test used; frequency of hose use; type of fiber in jacket; and operating pressure limit.

Information concerning the life of hose continues to indicate that the smaller sizes

Burst hose is dangerous to fire fighters at any time under any conditions, but particularly when operating on a roof, as in this incident. Fellow firemen rush to aid hosemen knocked flat by threshing line after it burst at coupling

have a slightly shorter period of serviceability which is most likely due to the greater amount of use to which it is subjected.

The average life of 1½-inch hose is 11 years; that of 2½-inch hose is 13 years, and 3-inch hose lasts approximately 13½ years. The following is a breakdown of the average service life by population groups:

Key	*1½-inch*	*2½-inch*	*3-inch*
(A)	6.9	8.8	10.6
(B)	8.4	10.0	12.4
(C)	11.5	13.2	13.4
(D)	11.3	12.7	13.8
(E)	10.7	12.8	13.9
(F)	11.8	13.9	14.6

Hose maintenance

Care of hose during its life is considered an important factor in its expected service. A total of 86 per cent reported all hose was cleaned immediately after use; 8 per cent did not answer and 6 per cent stated it was not cleaned.

Following washing, hose is dried in towers by 38 per cent; on racks, 21 per cent; and in dryers, 13 per cent.

A noticeable trend toward dryers is shown by the fact that an additional 9 per cent of those employing towers also use the modern dryer; 5 per cent of those equipped with racks also use dryers and one per cent of the total use all three methods. Ten per cent of the chiefs did not answer the question.

Changing the hose load on apparatus is by no means a standardized procedure although in 26 per cent of the cases it is done once a month. Every two to three months was the period stated by an equal number although periods up to and exceeding one year were reported.

Buying habits

An average of 31 per cent of all departments replace hose automatically according to a fixed schedule. In general, the remainder maintain a fixed supply level by purchasing sufficient quantities as necessary to replace defective lengths. The old hose is then given to other municipal departments or junked.

The estimated totals of hose purchased each year by the fire departments represented in the survey is 1,100,000 feet of 1½-inch; 1,900,000 feet of 2½-inch; and 300,000 feet of 3-inch, making a grand total of 3,200,000 feet.

The amounts bought at each purchase average as follows:

Key	*1½-inch*	*2½-inch*	*3-inch*
(A)	11,500	26,000	5,600
(B)	2,400	4,900	1,800
(C)	1,300	2,900	600
(D)	800	1,500	300
(E)	500	900	400
(F)	500	600	300

When purchasing, about half of all respondents use the Underwriters Laboratories specifications for municipal fire hose, while the remainder prepare their own specifications or buy special brands.

In preparing specifications in the future, 71 per cent of the chiefs intend to require synthetic fibers in the jacket weave divided between Dacron and cotton and nylon and cotton in about the same percentage as present ownership and 14 per cent stated they will order all-cotton jackets. The remaining 15 per cent failed to answer the query. Of the chiefs now using all-cotton, 44 per cent stated they will continue to so order; 24 per cent did not answer. More than 486 departments represented in the survey are presently using synthetic and cotton fiber hose. Of these, 5 per cent stated they will order all-cotton the next time; 102 did not answer the question and the remainder stated their intention to reorder hose containing the man-made fibers.

Purchasing habits are influenced by many factors, the most important being stated as "expected service life." Following in order of importance according to the fire chiefs are: Strength, easy handling, durability, light weight, compactness, resistance to mildew, low initial cost and resistance to chemicals.

Hose problems

Of the departments using all-cotton hose, 32 per cent reported serious problems with it. The greatest number of disadvantages reported (23 per cent) were due to difficult handling and stiffness; heavy weight was a close second (20 per cent), followed by mildew and rot (11 per cent), abrasion and scuffing (10 per cent), rubber deterioration (8 per cent), cuts and tears (5 per cent), and bursts from excessive pressure (5 per cent). Chemical action, kinking and coupling retention were also listed.

In contrast the disadvantages of synthetic and cotton fiber hose were less numerous in the returns. Coupling retention and cuts and tears were most frequently mentioned and totaled 4 per cent each. It is evident from the comments of the chiefs that they'd like to see improvement in the matter of coupling retention.

A surprising number of the chiefs (17 per cent) suggested there was considerable room for improvement in present-day couplings. Some of the statements relating to this subject were: "Quick, positive couplings made of non-corrosive metal"; "would like to see couplings of lighter weight"; "would like a deeper hose bowl in 2½-inch and 3-inch"; "would like to see quarter-turn couplings"; "more resistant to damage"; "a new type of quick-coupling"; "devise a method of attaching couplings without the messy expansion ring."

Lighter weight hose was suggested by 27 per cent of all respondents. It was expected this request would be limited to those presently employing all-cotton hose. However the suggestion was advanced by many now employing synthetic and cotton hose indicating a desire for even lighter weight than is now available.

Perhaps the most important conclusion of the study concerns the frank opinions of fire chiefs on the popularity of the synthetic and cotton fiber fire hose versus the all-cotton. A total of 79 per cent felt the man-made fiber hose will become more popular in the future; only four per cent felt it would be less popular. The remainder failed to express an opinion. □□

The water that counts is that which hits the fire. Hose such as this deserves no place in the fire line. This blaze in a southern city wrecked an industrial plant

International Association of Fire Chiefs Incorporates Fire Administration Institute

THE NEW YORK BOARD OF REGENTS has granted a charter incorporating the International Fire Administration Institute, a non-profit educational organization. The institute, sponsored by the International Association of Fire Chiefs, was formed to engage in research and otherwise obtain material for the preparation of courses of study in fire administration and related subjects.

Schools and colleges granting arts and science degrees, in accordance with the standards and requirements of state departments of education or public instruction, are eligible to participate.

Junior colleges or technical institutes may also participate provided acceptable agreement prior to inauguration of the program with a nearby school or college will authorize full credit transfer in the upper division for the B.A., B.S., or B.B.A. degrees. Such institutions shall function in accordance with the standards and requirements of the state department of education or public instruction which administers it.

The material and courses are to be available for use by educational institutions at the college level in the United States and foreign countries. The institute will work with and assist these institutions in the development of such courses of study and give financial assistance or scholarships to deserving students in the field of fire administration who otherwise would be unable to enroll.

The organizational meeting of the incorporators was held in New York City on July 14 and 15 to accept the charter. Present were trustees Chief Donald S. Charles, Charlotte, N. C., president of the IAFC; Chief Reynold C. Malmquist, Minneapolis, Minn., first vice president; Chief Arthur H. Lintelman, Baytown, Tex., second vice president; Chief G. A. Mitchell, Opelika, Ala., treasurer; Fire Marshal William J. Scott, Toronto, Ont., director, who was named chairman to serve until the annual meeting of the IAFC at Los Angeles in September; James R. Kreuzer, Queens College, N. Y.; and B. Richter Townsend, secretary-manager, who will serve as secretary and acting president of the institute.

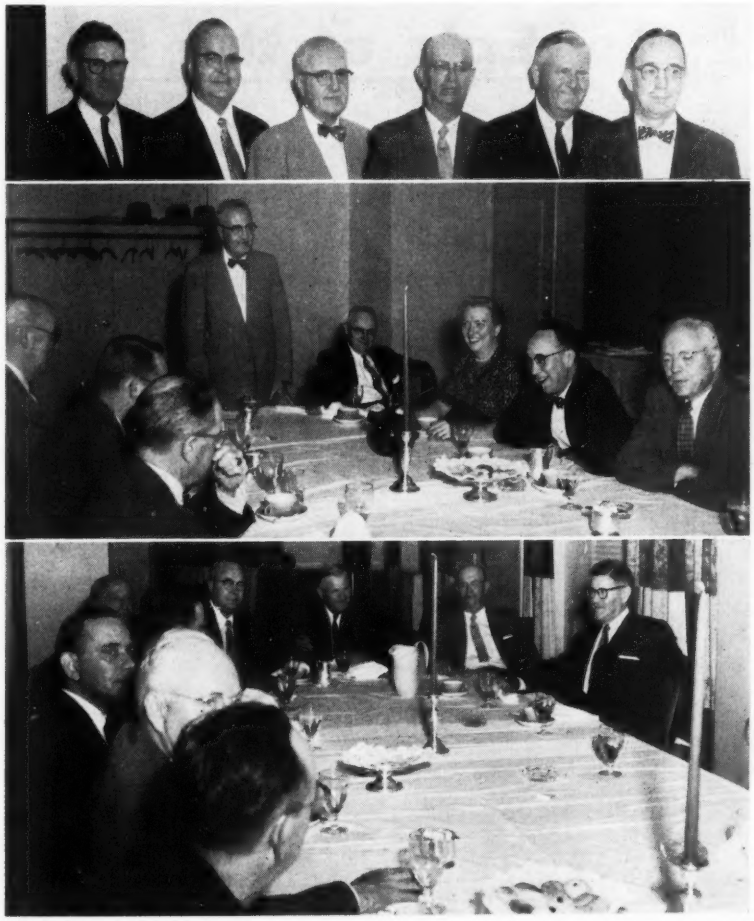
Members of the board of trustees who were not present include: Chief Leo C. Driscoll, Boston, Mass.; Chief William L. Miller, Los Angeles, Calif.; Chief William J. Taylor, Burbank, Calif.; James Duggan, Union Carbide and Chemicals Co., South Charleston, W. Va.; John D. Gerletti, Jr., University of Southern California; and Leonard C. Silvern, Hughes Aircraft Co., Culver City, Calif.

Chief Charles said that the fundamental principle of the Fire Administration Education Program requires graduates who are well-qualified in management skills, including the areas of personnel administration, budgeting and finance, promotion and enforcement of fire safety standards, public relations, human relations, building programs and civil defense. A second principle establishes professional development of leaders as an objective of the program.

The primary aim of the institute is to develop firemen and fire officers professionally through college-level courses for degree credit in existing schools and colleges. In this service, the institute will act as curriculum advisor in order to uniformize course titles, course credits and course content so transfer from college to college may be accomplished with a minimum loss of class credit to the student.

The secondary aim of the institute is to write and publish student materials which are presently non-existent or not functional, such as textbooks, manuals, textbooks and similar materials. Included in this service may be a correspondence

Continued on page 764



Upper: Board of trustees present at press luncheon who are also IAFC officers, include (left to right): Chief G. A. Mitchell, Chief R. C. Malmquist, Fire Marshal W. S. Scott, Chief A. H. Lintelman, Chief D. S. Charles, and Secretary-Manager B. R. Townsend

Center: Fire Marshal Scott speaks to press luncheon held in Hotel Manhattan. Seated to right of board of trustees chairman are (left to right): Roi Woolley, editor of Fire Engineering; Mrs. Eileen Cornwall, secretary to Mr. Townsend; IAFC Secretary-Manager Townsend; and Charles Potter, counsel to New York State Legislative Committee on Fire Laws. Press reporters are in left foreground

Lower: Grouped around table are (left to right): B. R. Townsend; C. Potter; J. R. Kreuzer; J. V. Straub, legal counsel; I. H. Case, general manager, Fire Engineering; Chief Malmquist; Chief Charles; Chief Lintelman and Chief Mitchell

New York's East River holocaust at its height. Blazing tanker Empress Bay and freighter Nebraska locked together drifting toward Manhattan Bridge. In foreground is one of several harbor tugs which aided in rescue effort. Tragic aftermath of this picture was sudden death of the photographer, William V. Finn, of the New York Journal-American, soon after shooting it

Epic of the East River

"This is an epic of magnificent response to the call of duty."—*New York Times.* A fireboat flotilla assisted by land-based units—and radio—win a dramatic and dangerous engagement with uncontrolled fire

FEW FIRES HAVE DEMONSTRATED the effectiveness of fire department radio, efficiently used, as that which involved the tanker Empress Bay, owned by the Petroleum Tankers Corp. of New York and the steamship Nebraska, owned by the Swedish Transatlantic Line of Gothenburg, in New York's East River, in the early hours of June 25.

But for the prompt and intelligent use of the New York Fire Department's two-way radio and the strategy employed by both land and marine units of the department, aided by the U. S. Coast Guard and commercial craft, a disaster of unprecedented magnitude involving not only river craft but miles of busy waterfront might well have eventuated.

As it was, the blast and fire brought total destruction to the tanker and its 280,000-gallon cargo of gasoline, heavy damage to the S. S. Nebraska, and came within an ace of wrecking the center of the Manhattan Bridge, when flames which flared aloft over 160 feet ignited it. Also seriously damaged was the fireboat William Gaynor (Engine 77), first of the fireboat fleet to respond, and prominent in the rescue of the crews of the burning vessels.

It all began about midnight June 24, when the two ships collided just east of the Manhattan Bridge. The freighter was bound from New Haven to Newark; the tanker from the Bayway Refinery, Linden, N. J., to Mount Vernon, N. Y. The 172-foot tanker was ripped open midships by the heavier vessel and its gasoline cargo spilled onto the river and ignited. As the two craft remained locked together, the freighter was quickly involved. It is estimated over 1,000 feet of the river's surface was soon covered by the flaming fuel, which lighted up the dockside on both Brooklyn and Manhattan shores.

Alarms come thick and fast

Brooklyn Fire Headquarters received the first notification of the disaster at 12:23 a.m. on the 25th, when the fireboat William Gaynor (Engine 77, Brooklyn) tapped out 2-2-2 77 over the boat telegraph circuit, reporting quickly by radio that the company was headed toward the blaze. One minute later, the Manhattan Fire Alarm Office received Box 128 (Batavia and James streets) which marks the location of Pier 31, East River. Two other boxes, 206 and 126 were snapped at almost the same time, followed by a "Class 3" building box. The telephone switchboards at Manhattan and Brooklyn fire communications headquarters were soon loaded with numberless telephone calls, some more or less incoherent but sufficient to convince the busy operators and dispatchers that a critical situation existed on the river, about opposite Pier 29 on the Manhattan side.

The assignment for Box 128 called for Engines 12, 9, 32, 7; Ladders 6 and 1 and Battalion Chiefs 2 and 1. Engine 12 under Captain Smiles and Ladder 6 under Lieutenant O'Shea reached the box within two and a half minutes. Chiefs Richmond of the 2nd and Driscoll of the 1st also made quick response, the former

reporting via radio such meagre details as were available upon reaching the dockside. Anticipating possible contact between the drifting blazing ships and the Manhattan shore, Engine 12 was directed to connect to and supply, the standpipe of Pier 29 East River and to place its deck pipe in position for operation. Engine 7 did likewise to protect Pier 31.

Meantime, the Gaynor, commanded by Captain Eugene Kenny, was in touch with Brooklyn and "Citywide" communications headquarters by radio, as it covered the half mile from its berth to the blazing vessels. At 12:26 a.m., "Citywide" was informed by Engine 77 that an oil boat was ablaze between the Manhattan and the Brooklyn Bridges. At that time, Captain Kenny requested at least two additional boats be dispatched. Two minutes later, Engine 57, the fireboat John D. McKean, Captain Gallagher, from the Battery, and Engine 86, the John J. Harvey, Lieutenant Farrell, from its Hudson River berth, were en route.

All fireboats summoned

Assistant Chief of Department, Thomas P. O'Brien (who also heads up the bureau of communications), in charge of the department at the time, had been notified by headquarters and was headed for Box 128, which location was to become the focal point of operations.

Informed by radio of the critical situation materializing on the river Chief O'Brien radioed for all available boats to be dispatched to Box 128 (Pier 31). Within the next four minutes, the fireboats John Purroy Mitchel, Engine 232, Lieutenant Albertelli; the Thomas Willett, Engine 78, Lieutenant Gallagher; the James Duane, Engine 85, Lieutenant Becker; the Fire Fighter, Engine 223, Acting Lieutenant Farrell and the Sylvia Wilkes, Engine 51 (newest of the fireboat fleet), Lieutenant Brickfield, were heading full speed for the scene.

Radio reports also reached Fire Commissioner Edward F. Cavanagh, Jr. and Fire Chief George David, only recently appointed head of the department, and Deputy Chief Alfred Mendey, First Division which includes the Battalions 1 and 2. On the Brooklyn side, Deputy Chief-in-Charge of the Borough Edward McGarry, and the heads of the 34th, 32nd, and 31st Battalions were informed by radio of events. The head of the Marine Battalion (25), Acting Battalion Chief R. L. Olsen, responding with the tender Smoke. This new boat (FIRE ENGINEERING June 1958) was destined to play an important part in the action, its movements together with those of the entire fireboat flotilla, being directed by radio.

Arriving at dockside, Chief O'Brien's first act was to check the various sources of information coming in and to size up the general situation. At that time the locked vessels, forming a giant floating torch, were yawing widely over the river, in the grip of the strong ebb tide. Passing directly under the Manhattan Bridge, heat and flames ignited ties and all other combustibles in its center span. At the time, it was impossible to foresee just where the floating conflagration would wind up, or what it would ignite on contact or heat by radiation.

It was determined from reports by the Gaynor, that a large tanker and a steamship, the Nebraska, were involved, and drifting out of control, interlocked. The fireboat by then had every one of its deck pipes at work, either trying to beat back the surface spill fire or, more important at the moment, to protect members of the crew of the Nebraska, who were in imminent danger from the flames spreading on that ship. That vessel was fully involved on the port side, and flames were working their way into the crew's quarters and passenger cabins and other sections of the vessel. Only the engine-room crew were below decks—and their fate was not known at the time. Some of the crew of the Nebraska had gone overboard in the effort to escape the flames.

In the maneuver to save the crew of the Nebraska, many of whom were forced to the extreme stern, the Gaynor was caught under the big ship's fantail, the propeller of the latter cutting a deep gash in the fireboat's hull, flooding the 44-year-old craft's boiler room. Captain Kenny, however, not only managed to get most of the Nebraska's crew off the ship, but was able to bring them, with his boat, to Pier 31, where immediate and successful steps were taken to prevent the Gaynor from sinking. This operation well rates a story in itself.

Meanwhile, Acting Chief Olsen, in the tender Smoke, had reached the scene, ahead of the two fireboats requested by Captain Kenny by radio. He further informed the communications bureau of the worsening situation. He was directed to pick up Chief O'Brien at Pier 31.

While heading for the pier Chief Olsen performed a rescue for which he has since been cited. The Smoke encountered 17-year-old Walter Mattefecht, a member of the Nebraska's crew floundering in the water. Suffering burns he had jumped from the burning ship, and was further threatened by the spreading blaze on the water.

When Mattefecht was unable to use the life preserver thrown to him from the Smoke, because of his injuries, Chief Olsen divested himself of heavy clothing, dove in after him, and brought him to the side of the Smoke where they were pulled aboard. Mattefecht was taken to the hospital as soon as the tender reached the pier.

Action directed from fireboat

Chief O'Brien, his aide and others reached the burning ships, by means of the busy Smoke and established headquarters aboard the fireboat McKean, from which point the marine fire control operations were directed. These had three immediate objectives, the first being to protect and rescue any members of the crews of both burning vessels that might be aboard; the second, to confine the spill fire spreading from the burning tanker; the third, to attempt to extinguish the fire on the underside of the Manhattan Bridge.

Brooklyn Box 471 (Fulton and Columbia Heights—at the Brooklyn end of the Manhattan Bridge) was snapped at 12:26 a.m. This was responded to by Engines 205, 208, 224, 77 (fireboat Gaynor, already en route) Rescue 2; Ladders 118 and 110; Deputy Chief Timothy Driscoll of the 10th Division and Chiefs J. R. Travell and A. D. Steier of the 31st and 32nd Battalions respectively.

Borough Chief McGarry, and Deputy Chief Driscoll—10th Division, assumed charge of extinguishing the bridge blaze, and patrolling the Brooklyn waterside for possible contact of the blazing vessels. Land units of the 2nd Battalion tackled the bridge fire from the Manhattan side. Engine 9 was ordered to respond and supply the bridge standpipe from the Manhattan end, stretch two lines and use its booster on the fire.

On the Brooklyn approach, Engine 208 stretched and operated three lines on the bridge to extinguish fire along tracks and

Continued on page 764

Blistered bow of sunken tanker Empress Bay projects from East River between Brooklyn Bridge in background and Manhattan Bridge (not shown) which was partly burned. Manhattan waterfront which was threatened is shown in distance. Note gasoline slick from tanker which necessitated closing river to all traffic

Photographs of fire operations are valuable for record, critique and training purposes. Cameraman must be equipped for taking pictures under difficult conditions —*Graflex Corp.*

Fire Service Photography Pays Off

The fire service is coming to realize that "the picture is worth 10,000 words" in fighting and preventing fire, administering fire departments, training firemen, investigating arson and many other applications

By FRANK HANAFIN*

TEN YEARS AGO fire department photography was in its infancy. Charles L. Roblee, photographer for the Champaign, Urbana and Joliet Fire Departments, in a talk to an Illinois Fire College session in 1948 observed that, "Few departments have full-time fire photographers, Los Angeles being an outstanding exception. Most departments and agencies acquire their photographs through newspaper morgues or from various news picture agencies. Today it is a hit-or-miss proposition, many departments or agencies not realizing the importance and possibilities in the field."

Today the picture has changed considerably. Many departments use photography extensively in training, fire prevention, community relations and the investigation and prosecution of arson and other violations of law. In addition to Los Angeles, outstanding among those departments using photography are Boston and Brookline, Mass.; Chicago, Ill.; Detroit, Mich.; Minneapolis, Minn.; New York City; Philadelphia, Pa.; Rochester, N. Y.; St. Louis, Mo.; Dallas, Tex.; Rockford, Ill.; Los Angeles County; and Woonsocket, R. I.

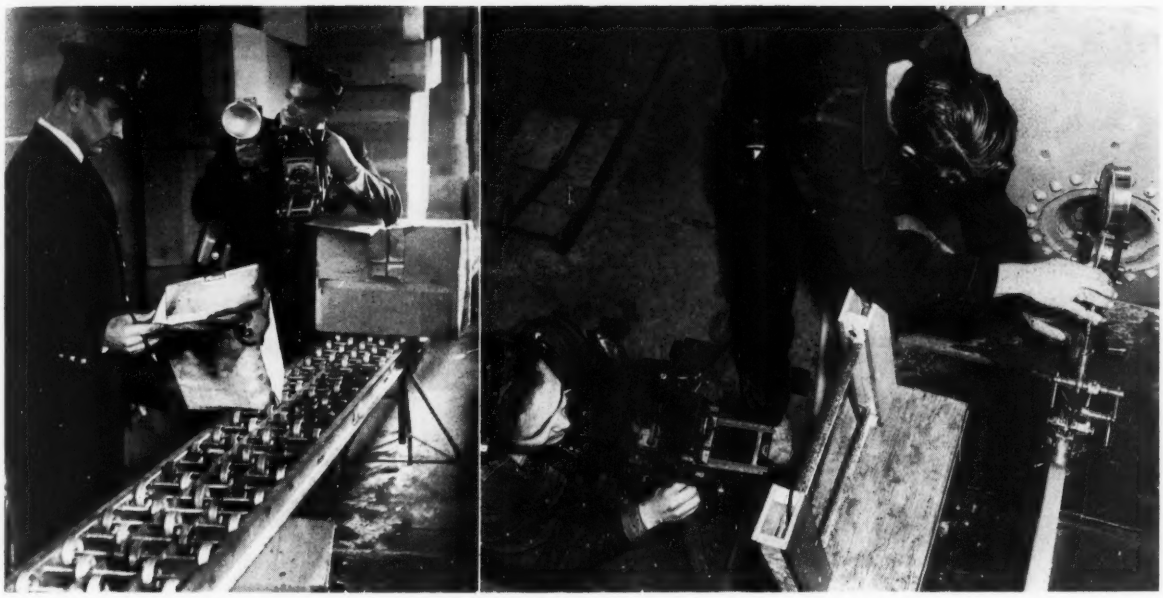
The change came about because some departments realized the importance and possibilities of fire photography, which Mr. Roblee pointed out 10 years ago. The availability of better photographic equipment was also a factor. Then, in some departments, firemen-camera fans—and there are plenty of them in the fire service—began taking pictures of fires, tournaments, training and the like. Some of their work came to the attention of fire force officials and soon they were "in business." The next step was a studio in which to work—and funds to defray costs of operation.

Interestingly enough, and quite unconsciously, FIRE ENGINEERING has reflected this acceptance of photography and its broadening application by the fire service. Not many years ago there were only a few firemen-photographers who submitted to the editors pictures of fires or other events of interest to FIRE ENGINEERING's readers, and few of these acted in any official capacity. Most of the photo illustrations came from buffs, or newspaper photographers, or the commercial photo agencies. Those which the chief of the fire department submitted were secured from local sources outside his department.

As time went on and progressive fire departments began to appreciate the value of favorable public relations, they began to include camera shots with their submitted reports and stories.

Today it is safe to say that most of the better photographs which illustrate fire accounts and related incidents in the pages of this journal are the products of fire department photographers. Many of them, like Bob Kennedy of Philadelphia; Ray Hellriegel, James Heffernan and others of New York's photo unit; George Beaumont of St. Louis; Larry Morris of Chicago; Lieutenant Ed Carroll of Brookline, Mass., and others have won acclaim as photo craftsmen.

*Frank Hanafin is assistant city editor of *Catholic News*. He recently retired from the New York Fire Department and was assistant editor of its publication *WNYF*.



Left: The New York Fire Department maintains a complete mobile photo unit in charge of Lieutenant Ray Hellriegel, who is shown photographing a charred carton during fire investigation—*N. Y. Times photo courtesy N. Y. F. D.* **Right:** Photographs of tests and research operations are useful to fire departments for record purposes and illustrating reports

Add to their ranks, the many not in, but closely kin to, the fire service like Paul Thayer, Ed Heavey and Bill Herries of New York; and Andy Palmer of Woonsocket, R. I., whose by-lines are found on pictures that have made history, and you begin to realize what a tremendous asset these devotees of the nation's fire service have turned out to be.

As the scope and responsibilities of the fire department photographers increased, so too has the number of cities, towns and villages whose fire departments boast departmental camera carriers. Some idea of their widening duties and influence may be drawn from the following condensed outline.

In fire fighting

Photography can be used to great advantage in fire fighting operations. With the camera, a permanent record of all operational details is available. These photos are valuable for illustrating special reports, for conference critiques, for determining standard operating procedures and drawing up "battle plans." If apparatus or equipment has been used to advantage in an unusual manner, if streams have been misdirected and proved ineffectual, if ladders have been poorly placed, if exposures have been —or not been—effectively covered, the good and poor practices can later be analyzed and described far more intelligently and forcefully with the use of photos.

A less common use of photography in fire fighting, but one that should be given serious thought in the light of the increasing use of helicopters by municipalities and improvement in sky photography, is aerial photography at extensive fires.

Carlock E. Johnson and Leon R. Thomas have described experiments they conducted with the Polaroid Land camera to determine its value in control of forest fires. They point out that, "Aerial pictures can be taken with this camera and dropped to the fire camp in a matter of minutes. Combined with observers' notes written in grease pencil on the picture, or by air to ground radio communications, the fire boss or planning officer can quickly and accurately interpret the information."

While this use of photography may now seem far-fetched for the average fire department, it must be considered in connection with civil defense and for widespread brush fires or for other extensive fires. Actually some western fire departments are already combining the plane and the helicopter and the camera to improve fire reconnaissance, size-up and attack.

Above: The St. Louis Fire Department's official photographer is George Beaumont. **Right:** Lieutenant Robert Kennedy, photographer of the Philadelphia Fire Department

In firemanship training

A more common and highly advantageous use of photography is in training the fire fighter. Every experienced fireman realizes that training is not just for the recruit to the fire service. Of necessity it must continue throughout the fire fighter's entire career. The development of new chemical products and technical processes introduces new hazards. The member of the fire service, if for no other reason than self-preservation, must keep abreast of new methods of fire fighting and the use of new apparatus and equipment.

During World War II, photography was found to be of invaluable help in training members of the armed forces and defense workers. It is proving of similar value in the training programs of many departments. Evidence is found in most of the country's fire schools which are us-

Los Angeles County Fire Department keeps a movie record of fires. Here photographer, Captain George Hutchinson, shoots the Signal Hill Hancock refinery fire. Fire fighters in photo are from the Signal Hill and L. A. County forces—*L. A. County F. D. photo*

ing camera craft of all kinds as aids to teaching.

The department photographer or photo unit should be ready to prepare slides for illustrating lectures on fire fighting evolutions and inspection procedures, as well as training films. Color photography may well be used to teach members to identify various hazardous chemicals by the color of gases and flames. An obvious use of photography is in the preparation of training manuals.

In fire prevention

One of the most important uses of fire photography is in the field of fire prevention. Photographs of violations are a valuable supplement to an inspection report. When used in court as evidence, they insure enforcement of fire laws, and many times bring about conviction of violators. As Chief Wayne E. Swanson of the Rockford, Ill., Fire Department noted in an article on photography and fire prevention in the October 1952, issue of FIRE ENGINEERING, when an owner or occupant is shown the picture of a violation, "right then an agreement is usually made to correct the violation."

In the same article Chief Swanson pointed out that "the photograph of the hazard always shows up the violation better than the naked eye can see it, as one's eye is often distracted by supporting scenes around the hazard, but in a photograph, one's attention is focused directly on the hazard."

The use of photos in public fire prevention educational programs is not new. Many departments have been using dramatic photographic displays in this way for years. But, whereas departments previously depended on newspaper morgues or news picture agencies for whatever photos might be available, today the department photographer or photo unit can supply pictures taken from the point of view of the fire service.

In arson

Photography has became vitally important in the investigation and prosecution of arson. Tool marks on windows or doors where break-ins have occurred, the presence of unnatural material or materials in the wrong place, evidence of trailers used spread a fire from area to area, the color of smoke and flames or of residue, can all be important in the detection and prosecution of arson. But until the application of advanced photography to the tasks, it was practically impossible to secure evidence that would stand up in court.

Photos of this type serve to refresh the memory of witnesses and help them to explain their testimony. They also help the jury to understand the case more clearly. Experts point out that for photos to be acceptable as evidence, they must have been taken immediately after the fire and truly represent the scene as it actually was.

In fire administration

Photography is important also to fire officials in the administration of the department. Photos are valuable for report illustrations.

An increasing number of fire and police departments are using photos in accident investigation and subsequent court actions, to establish negligence and the extent of damages.

The camera in capable hands can be of inestimable help to fire administrators in the preparation of budget plans and programs of modernization, etc.

In public relations

Anyone who has viewed movie trailers at industrial fairs or conventions, or has seen recruiting and similar trailers on TV, can readily understand the value of photography in public relations. Recently line organizations of the New York Fire Department produced a 30-minute documentary color motion picture depicting the hazards of fire fighting, the harm of false alarms, and showing companies operating at actual fires. Fire Commissioner Edward F. Cavanagh, Jr. hailed the production as a means of "putting the public solidly on the side of the department." Los Angeles, Minneapolis and many other cities use photography as an excellent promotional asset.

Organizing for photography

Some large departments maintain a photo section with a staff of professional photographers, usually assigned to the fire prevention or inspection unit. The New York Fire Department, on the principle that photographers with a training in fire fighting and available to respond to a call upon notification were essential, has assigned firemen with previous experience in newspaper photography, or similar background, to its photo unit (which incidentally rolls to multiples and special calls).

It has been suggested that in a medium-sized department, a professional photographer attached to one of the department bureaus could handle the necessary photography. While this may often work out, experts point out that it is far easier to train a fireman in the use of a camera than to train a photographer to look for the fire service aspect of possible "shots." As Graflex, Inc. points out in a brochure on fire photography, "After only a few hours training, a fireman will be able to take adequate pictures. As experience is gained on the job and through training, he will quickly master the latest Graphic camera."

In the smaller departments, a chief's aide, fire prevention officer or training officer could be detailed to take the needed photographs.

The necessary training for firemen without previous professional experience in photography could be acquired in professional schools, from and with the help of local news photographers, in adult education classes or from instruction manuals.

In one village of about 6,000, with eight paid men and about 250 volunteer firemen, one of the paid staff, Lieutenant Ed Roth, created an entire inspection routine around the camera. Pictures were taken of violations and pertinent subjects, the prints mounted on cards and filed with appropriate signals for follow-up by fire inspectors. The point is that Lieutenant Roth had no previous training in photography, and at present, his photo lab is largely under his hat.

Typical of the equipment used by a large department is that of Minneapolis which uses five 4 by 5 Speedgraphic cameras and film holders, five Heilbrad flash attachments and cords, three Stroboflash attachments, three 35 mm. film cameras and flash attachments, three 16 mm. motion picture cameras with telescopic lenses, three light meters, six gadget bags for equipment and four tripods.

The Minneapolis department also uses

Continued on page 769

Our Neglected Fire Alarm Systems

By ROI B. WOOLLEY*

IN THE FACE of mounting fire losses, fire protection engineers these days are giving serious study to cause and effects. Why is it, they say, that with all the emphasis on fire prevention, better fire fighting equipment, operating and training techniques, fire losses continue to mount? And in this probing into whys and wherefores, they have come up with some disturbing facts.

One of these facts deals directly with the very heart of the fire protection business—fire alarm communications. And what is disturbing about it is the conclusion which must be accepted, that by-and-large, our fire alarm communications are in deplorable condition, measured against the advances and improvements made in other essentials of municipal fire protection.

The plain unvarnished facts are that most of our telegraph signal systems have not only *not* been expanded to accommodate the nation's economic and other growth, but they have not even been expanded within the limits of their original design. Not a few are today nearing total collapse because they have been neglected and starved by inadequate funds for maintenance and the very minimum of expansion. Some have about reached the point of abandonment—a number have already given up the ghost.

As an example of the inevitable results to be expected from a constantly neglected fire alarm system, one city in particular stands out—New Orleans, La. What happened there was covered at length in FIRE ENGINEERING of December 1953, in an article entitled "Shall The Telephone Replace Municipal Signal Systems." Previously in 1928, and later in 1948, it was reported that the fire alarm system was practically obsolete, very inadequate and seriously unreliable. Practically no major improvements had been made on the system. As a result it reached a condition where reliable fire alarm service necessitated the installation of a complete new system.

In 1953 a firm of professional engineers made a complete survey of the fire alarm needs of this city. As cost comparisons favored the coded telegraph system, they recommended an installation of this type. However, the old system was in such a deplorable state of neglect that the city could find no practicable way to finance its rehabilitation and expansion.

It came as no surprise when, in 1955, the city council voted to contract for leased emergency telephone service to replace the dilapidated telegraph system which had virtually been exhausted by inadequate funds.

Chairman, Communication Committee, I.A.F.C.

New Orleans isn't the only city that has had to undergo a 'major operation' to put its fire alarm system back on its feet. One has only to study the survey reports of the National Board of Fire Underwriters and the insurance rating boards, to attest this statement. City after city has seen its fire department down-graded because of a decrepit and ailing fire alarm plant.

Old age in communications

Recently reports were received from 73 representative fire departments throughout the country concerning the status of their fire communications systems. Of these 73, 37 reported their central offices were purchased before 1930. Roughly, therefore, better than 50 per cent of the fire alarm offices are more than 25 years old. It is evident that this includes the "best" of the systems, as informal estimates reaching FIRE ENGINEERING from authoritative sources indicate that 75 per cent of the central offices throughout the country are more than 25 years old. The number that are in the 35 and 40-year-old class would surprise you!

And just to complete the picture, in the 73 reporting, 32 per cent of the fire alarm boxes are of the break-glass or locked-

Progress in Communication, Signal Systems

Fig. 1 (left): Old-time telegraph fire alarm box originally used in Boston, Mass. **Fig. 2 (right):** Peerless three-fold successive box circa 1935—*Gamewell Company photos*

Fig. 3. Further development of three-fold non-interfering, quick-acting door type with reflective lettering—*Bridgeport Post photo*

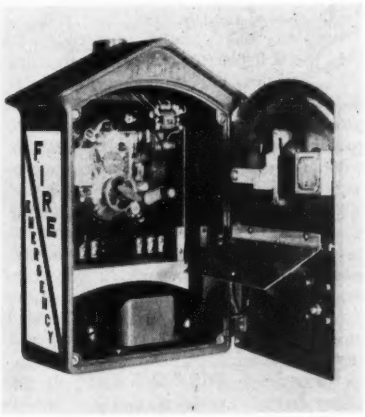


Fig. 4. Latest modern citizen's fire emergency call box incorporating both phone hand set and conventional telegraph mechanism

Left: Modern-type security control and sprinkler supervisory system installed at Glenn L. Martin plant, Orlando, Fla. Note trio of recorders (top of console) giving permanent day-by-day condensed printed records of all events which occur. Multiple applications can be made with some basic equipment for automatic fire detection, sprinkler supervisory, manual fire alarm control; watchman's tour; plant fire and security control; remote or proprietory station receiving; central station; emergency communication or municipal systems—*Notifier Corp. photo* **Right:** Latest packaged fire alarm control unit (for five-box circuits) completely self-contained with recording and battery inside cabinet—*Gamewell Company photo*

door types requiring delaying action to turn in an alarm, as compared with the modern quick-action door box. Twelve per cent of the above are of the old locked or key-type, with the key in the lock or on the side of the box.

The average local fire alarm superintendent reports the need for 25 per cent more boxes than he has in his system. And the findings disclose the discouraging fact that in spite of this need, less than 10 per cent of the boxes reported as needed in the years 1954 and 1955 were actually purchased. The boxes purchased included those needed for replacement so the adjusted figure for additional box coverage is probably 5 per cent.

It might be added that these 73 reports came from the most alert and progressive superintendents and chiefs throughout the country. One is compelled to ask, therefore, how serious are conditions in the balance of the country?

Why has this situation occurred?

In the first place, let it be said that fire chiefs and their fire alarm superintendents and other communications personnel are well aware of the generally deplorable condition of their plants. Here, too, the proof is seen in the reiterated recommendations for improvements contained in their annual reports—as well as in the Underwriters' published warnings.

It is no secret that today, repairs demand major replacements (a condition worsening yearly) and that these replacements are difficult to finance with existing pressure on municipal budgets. It is well known that many economy-minded municipal officials have "orphaned" the fire alarm systems on the theory that "we've gotten along pretty well with 'em for a quarter of a century—they'll serve many more years."

It is a regrettable fact, too, that not a few fire chiefs who have stood before their civic bosses and fought with everything they possessed for other essential facilities required for their fire departments, have advanced only lukewarm appeals for improvements of their fire alarm plants. All the blame cannot be placed on the budget-pinching municipal officials; a lot of fire department heads must share the responsibility.

In retrospect, we find that during the 10-year period preceding the depression of the 1930's, the importance of fire alarm in a municipality's fire defenses was prominently regarded, resulting in a continuance and even a resurgence in such fire alarm activity. The continuity of many fire alarm programs, started in this previous period was interrupted by the advent of these depression years, the seriousness of which needs no elaboration. What funds a municipality could find during these lean years were spent in unemployment relief, and were pointed largely to those public works projects employing the maximum number of unskilled labor.

Depressions and wars

In this climate, fire alarm programs, as well as many other important capital projects, were deferred. This static condition continued for several years, until municipal tax revenues, on the increase in the late 1930's, once again restored purchasing power to the municipalities. Unfortunately, this condition was short-lived, to be interrupted by World War II with its scarcities of material and manpower. Only a minimum number of municipalities, those in strategic military areas, were able to obtain priorities for precious military materials and labor to carry through their plans for system improvements and expansions.

Thus for a long period of 15 years, most municipalities were forced by the depression and war to forego practically all fire communication projects. During this time, the fire alarm systems of the nation were literally starved for materials and funds. Their deterioration, let it be said, was not due to lack of foresight or planning on the part of municipal officials, but rather to economic pressures over which they, nor anyone else, had any real control.

This 15-year forced moratorium on all but the extremely urgent capital projects produced a long list of deferred construction programs for later financing. These included schools and other public buildings, highway projects, incinerators—to mention only a few. Apparently in the competition for first place on the ever-increasing budget and capital expenditure list, fire communications have fared poorly. The many other municipal facilities, as mentioned before, had reached the point of utter depletion. The fire alarm systems, perhaps as a tribute to the quality and safeguards built into them, inherently incorporated a long life. Such maintenance as was available for them during these years was sufficient to keep them in satisfactory normal operation, even though far below the levels set by equipment of more modern and efficient design. Naturally, operating on a shoestring budget, the immediate goal of those responsible for maintenance was system operability, and programs for expansion and modernization had to go by the board for the time being.

That this trend has been all too prevalent was confirmed in another recent ran-

dom survey of certain municipalities. A compilation was made of the purchase of equipment and supplies by these communities for their fire alarm systems over a 10-year period prior to their leasing of emergency telephone service. These figures show the startling effects of a continually reduced budget for system extensions and replacements, resulting in slow rot and eventual abandonment of the municipally owned and operated signal service. To hasten the doom of the telegraph system, one city (doubtless a rarity) actually turned back to the general fund each year a substantial part of its meagre fire alarm budget! This neglect, incidentally, is not confined to small communities as the group included cities of 175,000 and over in population.

Question of ownership

There is evidence that the leased telephone service has had a considerable impact upon the entire field of fire alarm communications. The question arises: Is the leased telephone-type of service less or more favorable to a municipality than a long-range, far-sighted program of maintenance of its own signalling system under direct control of the fire service?

The fire alarm system is all right, but some users of it aren't. New York City's fire alarm communications plant is the largest and one of the most modern in the world, yet false alarms are on the increase. To help cure evil, Fire Commissioner Edward F. Cavanagh, Jr. (at mike) with Fire Chief George David (right of the pedestal) warn area folk of dangers of malicious false alarms. Immediately behind the commissioner is Assistant Chief Thomas P. O'Brien, in charge of Bureau of Communications—*N. Y. F. D. photo*

As late as 1953 this ancient phone was part of the intercommunication system of the Jacksonville, Fla., Fire Department. Fire Chief J. B. Chancey (retired) makes the last call on the antiquated hand-crank phone. Department now has modern PBX switchboard system

City Council President John S. Gibson, Jr. cuts ribbon opening the Los Angeles Fire Department's new all-purpose fire and public "PhonAlarm" emergency alarm system. Assisting are K. V. Keeley, chief, fire and signal division, Department of Building and Safety, and Deputy Fire Chief W. R. Pross

Thus far, at least, a large majority of municipal fire alarm superintendents, and of fire chiefs who have expressed themselves on the subject, vote for retaining fire alarm communication systems within their own jurisdiction, providing funds for maintenance and expansion will be forthcoming.

The whole question of control of voice communications is still a confused issue in the minds of many fire officials; it is quite apparently a riddle, also, to the average municipal administrator—and to the man-on-the-street. The situation is further confused by conflicting claims for certain types of municipal signal service, and by political expediency and motivation.

Before any radical changes are made in what have been generally accepted fire alarm communications plants, this entire moot subject should be thoroughly and dispassionately studied and analyzed. The fact cannot be ignored that coded telegraph systems are serving fire departments of approximately 2,000 United States and foreign municipalities. They represent a vast investment of tax revenues. They are admittedly economical and perform efficiently and well. They have the approval of Underwriters and other experts in the fire service field. For these and other reasons, it is difficult to see why municipal management would permit them to fall into a state of neglect through lack of funds for maintenance and improvement. Of course, almost anything can happen under the guise of expediency, particularly the political variety.

In many public safety departments from 80 per cent to 90 per cent of the budget is required for salaries and wages. The steady upward pressure of wages for fire and police personnel—and for all other municipal services, too—coupled with the downward pressure on hours of work, has put a further squeeze on capital expenditures. Small wonder that municipal administrators today are asking: "What present services can we do without?" Certainly few will honestly believe that they can safely do without public fire alarm systems. Unfortunately, however, too many show by their inaction that they feel they can cut back on them.

This may explain the willingness on the part of those initiated into the importance of municipal fire alarm communications to experiment with such so-called economies as integrated municipal services, and farming out of critical fire service facilities. Miscalculations in a composite operation like the communications division of a fire department are easily made by inexperienced municipal administrators and political leaders, even though they may be fairly disposed.

Picture not all black

From the rather dismal picture of fire service communication systems which we have painted, thus far, one might consider our signal communications, particularly our telegraph alarm systems, in a bad way; that no progress is being made in improving them and in their purchase and installation. This is of course far from the truth. Actually, there have been, and there are, noticeable mechanical improvements being introduced—and not all municipalities are being backward about coming forward for them. Only recently the City of Yonkers, New York placed an order for $465,000-plus to rehabilitate

Continued on page 772

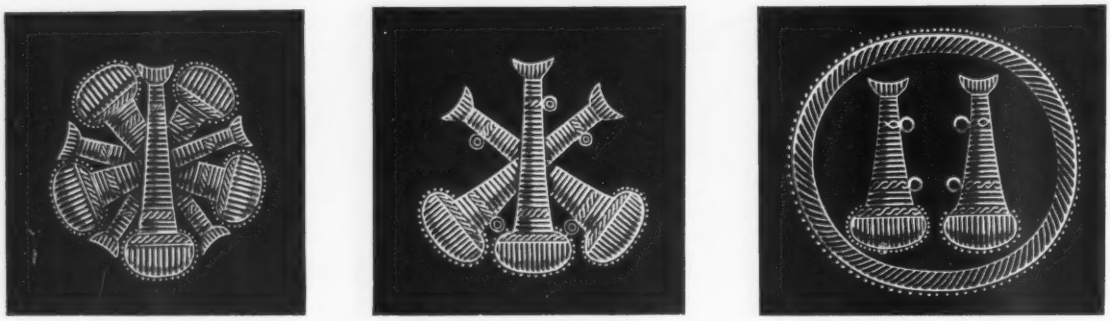
Badges, Buttons and Braid

A glance into the intricacies of fire service insignia—with a hint that this detail may be in for some future streamlining

By CLARENCE E. MEEK
Honorary Battalion Chief and Librarian
New York Fire Department Library

Chief's embroidered cap badge circa 1860

Company officer cap insignia circa 1860



Embroidered lapel insignia—Left: Chief; Center: Deputy; Right: Captain

Modern metal insignia—Left to right: Chief, assistant chief, silhouette deputy chief, battalion chief

ALMOST FROM THE INCEPTION of paid professional fire departments in the United States, the device which we call the Maltese Cross (but which is actually a variation of the Cross Pattee), and the trumpet, have been the symbols of the fire service and the emblems of official authority. This background of nearly a century of usage has established a custom that is one of the strongest traditions of the fire fighting profession.

None of the pictures of volunteer firemen of the pre-Civil War era which we have seen shows the Maltese Cross; it is believed that the first use of the emblem by the fire service was in 1865, when the rules and regulations of the new Metropolitan Fire Department of New York prescribed the cap device to be "a white metal Maltese cross, with the emblem of the department in the center, the letters M.F.D. and the number (numerically) on the points, and placed in the center of the front of the cap." This design was modified in 1879, and has not since been changed.

The trumpet introduced

From the available evidence it would appear that it was in 1868 that the trumpet was first used as insignia of rank in the fire service. General Alexander Shaler, president of the Board of Metropolitan Fire Commissioners was responsible for adopting a reproduction of the trumpet, which had for some time been recognized among the volunteers as a symbol of authority, as well as a useful voice amplifier, by being carried by all fire officers at fires and on parades.

The "Bill of Dress" adopted in January of 1868 prescribed the trumpet devices to be worn by all officers "to be embroidered in gold bullion on colored background—dark blue for chief officers, red for hook & ladder company officers, light blue for engine company officers, and light green for chemical company officers." These devices were to be sewn on lapels of uniform coats, and in the center of cap fronts. It will be noted that gold was used for all officer ranks. At that time buttons were of white metal for all officers, gold-faced buttons for the chief officers being adopted in 1877.

An interesting variation of the colored

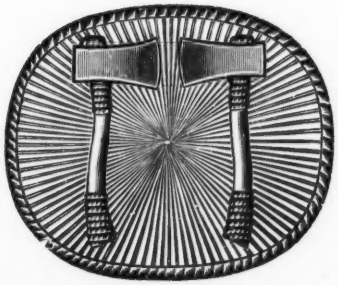
Modern cap or uniform badge

Early style chief's badge

Dress uniforms of Philadelphia Fire Department. Left to right: Unidentified battalion chiefs, Assistant Chief Joseph M. Clarke, ret., and Deputy Commissioner-Chief of Department George Hink. In mufti is Chief Raul Gandara, Fire Service of Puerto Rico

—Philadelphia F. D. photo

Presentation badge



Modern ladder captain

Modern silhouette-captain

backgrounds which identified the branches of the service were the red and black patent leather pieces with attached white metal badge numbers, worn on the straw hats which were part of the summer uniform from 1868 to 1905.

Following its first use in New York as officers' insignia, the trumpet device was adopted by other cities and has become universally recognized in this country as a symbol of fire officers' rank. However, its continued use to define all ranks in the larger departments, at least, may be threatened by the multiplicity of line officer titles, and limitations of the number of easily recognized insignia devices which can be formed from and around the trumpet design.

In 1946 the New York Fire Department adopted a design of six crossed trumpets but this was not easily distinguishable and was discontinued, the insignia of the highest uniformed rank being the five trumpets of the chief of department. Through the years, although the trumpet still is universally used to signify top rank, there has been no exact uniformity on the number of trumpets to indicate a particular rating. In this city, two crossed trumpets have served to identify battalion chiefs; three are the insignia for division chiefs; and two titles —deputy chief in charge and assistant chief share the device of four crossed trumpets.

Metal replaces embroidery

With the substitution of metal devices for the embroidered insignia in 1890, it was considered impractical to have distinctive background colors to identify the branches of the service, and the axe was selected as the ladder service symbol, although some cities have always used the trumpet for all branches by placing the devices on cloth backgrounds of distinctive colors, as in Chicago, or by an identifying letter above the company number, Boston-style.

A later development by some fire departments is the exclusive use of the trumpet without any distinction as to branch of the service or unit number. This follows the practice of other services and is less confusing, complicated and expensive. To some students the axe appears inappropriate as a symbol of the fire service; for one reason, psychologically, to many people it suggests destruction of property by axe-wielding firemen.

Military insignia weighed

In some cities the entire problem of appropriate insignia to delineate the various fire department ratings has been under study. There has been discussion, and questionnaires have been circulated, on the question of adopting military insignia for the fire service—stars, eagles, oak leaves, and bars for officers, and chevrons for special ratings. It is claimed by proponents of the military type insignia that because a very large proportion of our population have had close contacts with the armed services over the years, nearly everyone knows the relative ranks of personnel wearing military insignia, while comparatively few citizens know what the crossed and parallel trumpets indicate.

Not only are some cities concerned about the use of axes and trumpets as "common denominators," but they face the problem of the form the badge or emblem shall take—and how and where it shall be worn.

The growing practice of dispensing with coats during hot weather emphasizes the desirability of adopting some sort of collar devices to identify officer ranks. A fireman visiting a department office or quarters might ignore a youthful chief officer who wears no visible insignia to show his rank, while giving a snappy salute to an older man who turns out to be a junior officer, but also without visible indication of rank. This situation is frequently aggravated by the lack of uniformity in the dress of fire officers.

A particularly annoying and confusing lack of standard practice among fire departments also exists in the matter of stripes on sleeves of uniform jackets and coats. These stripes, if used, may be somber black, bright gold, silver or other colors and indicate rank or length of service, or a citation or decoration without significance. Quite a few departments use a single stripe to distinguish all officers from the fire fighter ratings. It would appear that the majority of departments do not provide for length of service markings; some cities use stripes or small sleeve devices of some kind for this purpose. This practice is encountered more frequently among the volunteer forces.

Awards and commendations

The awards of medals and commendations for acts of bravery or exceptional service are tremendous builders of morale and esprit de corps, and these presentations attain their greatest effectiveness if recipients are permitted to wear a ribbon or miniature medallion, or a sleeve device of some kind. The type and kind of award and the method of wearing it, varies with the individual fire departments. New York gives its roll of honor men miniature gold, silver or bronze maltese cross devices, according to the class of the award, which are worn on the sleeves. These are the only decorations permitted to be worn, except when departmental orders specifically permit the wearing of fire department or military medals on special occasions. Here, too, it would seem there is room for most universal agreement between services on both the form of insignia to be worn—and how they should be worn.

In recent years there has been noted an increased use of "scrambled eggs" on the cap visors of top ranking officers. In a few departments this decoration is limited to the chief of the department; in some cases the staff and even junior officers are so identified. One suggestion has been the use of such decorated visors to identify top commanders as distinguished from subordinate chiefs. Various opinions have been advanced on the wisdom and practicability of "dressing up" fire force officers.

Cap insignia are apparently more standardized in design and usage than uniform badges; in the designing of coat badges, fire departments often depart from the traditional Maltese Cross to incorporate city seals or distinctive symbols associated with the city's history. A study of the catalogs of almost any badge manufacturer will bear this out.

The majority of the departments do not require the coat badge to be worn in an exposed place on the uniform except when on certain prescribed special duties. When a New York fireman goes on theatre duty he is given the company's "theatre detail" badge of distinctive design, but building inspection and other departmental duties where the cap is to be worn do not require that the "tin" be displayed on the uniform.

Putting up a good front

Identifying hat fronts for fire helmets are a universal custom in the American fire service. For the most part they follow the same general pattern. Some employ color to indicate the particular branch of the service to which the wearer is attached, and to identify rank. Nearly all fronts embody numerals to signify the company unit, or the serial number of the individual wearer. Outside the fact that white is the accepted color to designate an officer, there is no color standardization in either the headgear or its front.

Hat shields are almost universally made of leather although metal and plastic have been tried out. As an interesting sidelight, the eagle head, which in years past invariably held the tip of the hat shield in its beak, has in many places either faded out of the helmet picture, or has been streamlined to better meet the contour of the headgear itself.

Continued on page 767

Color Codes are used by fire departments for identifying members of various companies at scene of fires. Helmet of San Francisco fireman designates ladderman
—San Francisco F. D. photo

Now's the time to

MODERNIZE with FOAM

Today's special hazards demand fire fighting equipment to meet all emergencies. Akron Brass gives you two foam set-ups that will fit large or small departments. They are fast, efficient, rugged and easy to use.

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DUBL-TUFF *plus* **IN-LINE** *or* **BY-PASS EDUCTOR** *plus* **DUBL-TUFF NOZZLE**

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(FOAM — WET WATER — WATER FOG)

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The finest hand line nozzle ever made . . .

Impinging, high-velocity center cone jets give dense, far-reaching fog

Circumference teeth "chew" stream even more thoroughly into fine particle fog

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Akron quality ball shut-off "Click"

Positive stream positioning by feel or sight. Clicks into fog patterns or straight stream

Adjustable through all angles of fog

Swiveling "Rocker Lug" base — handle is always on top†

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Dual Gallonage

choice of two water rates from one nozzle —depress and ½ turn baffle in either direction to get lower gallonage—another ½ turn and you return to full gallonage

Constant Gallonage

at every setting on both water rates

Water lubricated, never needs grease

Man-size handle

Style 715 nozzle shown life size — note how compact it is!

PERFORMANCE DATA
at 100 P.S.I. Nozzle Pressure

Style	Size	GPM	List Price FB	List Price DP
710-R*	1"	30	77.65	82.00
715	1½"	95-60	94.55	88.95
715-R	1½"	95-60	94.55	88.95
725	2½"	240-120	106.85	112.35
725-R	2½" for dir. con.	240-120	106.85	112.35
729	2½" for P.P.**	240-120	91.65	99.15
729-R	2½" for P.P.	240-120	91.65	99.15
749	2½" with P.P.	240-120	116.75	130.50
749-R	2½" with P.P.	240-120	116.75	130.50

*Rigid Base **Play Pipe

AKRON BRASS
FIRE FIGHTING EQUIPMENT

Akron Brass Mfg. Company, Inc., Wooster, Ohio

These exclusive features make

IMPERIAL

your best fire fighting aid

CONSTANT GALLONAGE

GPM is always the same, no matter what the setting. Straight stream, narrow or wide fog—there's no fluctuating pump pressure, no varying back pressure.

DUAL GALLONAGE

In *one* nozzle you get *two* gallonages. How? Without changing nozzles you can do it easily with the IMPERIAL. In the 1½" size you can change from 30 GPM to 60 GPM. In the 2½" size you can change from 240 GPM to 120 GPM. All you do is depress and half-turn the baffle. Conserves water, reduces water damage, gives you the versatility of two nozzles at the end of your line *without shutting down.*

2½" 1½" 1"

BEST FOG and STRAIGHT STREAM

of any fog nozzle. Impinging high-velocity center cone jets give a solid, far reaching fog. Full gallonage straight stream reaches farther with water gallonage at full rated capacity of the nozzle.

WATER LUBRICATED

Works easily at all pressures, never needs grease. Efficient ball shut-off is water lubricated.

SMALLER, LIGHTER, TOUGHER

The materials used in the IMPERIAL have been carefully engineered to reduce weight and size without sacrifice of strength or capacity. The result — one lighter, tougher, easier-to-use nozzle.

FOAM–FOG–WET WATER

First nozzle engineered with matching eductors for production of foam, wet water or fog in all degrees of pattern and straight stream . . . all without changing nozzles or shutting down. Produces foam or wet water at all settings.

A BREAK-APART NOZZLE

when teamed with Akron's GIZMO shut-off.

MODERNIZE WITH FOAM

Use this Akron team for superior fire fighting.

UNOX + AKRON EDUCTOR + IMPERIAL NOZZLE

For tougher, quick-acting foam or wet-water. 1,000 gallons of water will produce up to 10,000 gallons of fire-fighting foam with UNOX.

UNOX®

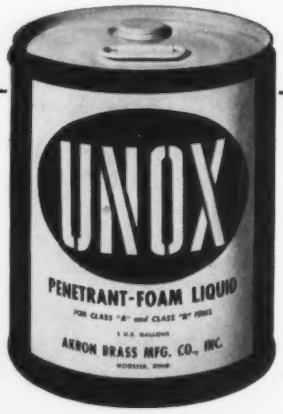
the 4 Dimensional Foam

1 SMOTHERS AS A FOAM
Actually "chokes fire to death" by cutting off all air with a thick blanket of small-bubble foam.

2 SPILL FIRES QUICKLY COVERED and controlled. UNOX foam travels rapidly over the whole fire.

3 PENETRATES AS "WETTER WATER"
Unequalled as a penetrant of burning mattresses, cotton bales, charred wood and similar water-repellant surfaces. Goes to the heart of the fire where combustible gases are forming, and kills it!

4 COOLS Absorbs heat like a sponge.



UNOX® *foam is now being used with Akron's Automatic Turrets at Missile launching sites and at plants of the Atomic Energy Commission.*

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Only **UNOX**® *has all of these features:*

Foams in any water, brackish, hard, soft or sea water. Improves the efficiency of any available water as an extinguisher for Class "A" or "B" fires.

Less water needed, because UNOX foam improves the fire fighting effectiveness of water, then breaks down into "wetter water" and keeps working. You need much less water than you'd expect to use.

Expands tanker fire-fighting ability 8 to 10 times. With limited water supplies UNOX will expand your fire-fighting ammunition 8 to 10 times.

Less water damage with UNOX foam. First of all, you're using less water; second, UNOX penetrates. Your fire's out faster.

Economical—a little UNOX goes a long way. 2% UNOX makes foam—1% for wet water. 2 to 3 times as potent as ordinary foam.

Safe to use, non-toxic. Requires little clean-up because it leaves no residue.

Protects objects exposed to fire by forming a thick insulating "blanket," even on vertical surfaces.

Concentrate won't freeze, stands temperatures as low as —20 degrees F.

Won't deteriorate in storage, your supply is always ready to use.

Underwriters' Laboratories approved and listed.

Your UNOX foam team:

For tougher, quick-acting foam or wet water. 1,000 gallons of water will produce up to 10,000 gallons of fire-fighting foam with UNOX.

UNOX *plus* **IN-LINE** *or* **BY-PASS EDUCTOR** *plus* **IMPERIAL NOZZLE**

QUANTITY	Montana, Wyoming, Colorado, New Mexico and East	Idaho, Utah, Arizona and West
5 gal. cans	$4.75 gal.	$5.15 gal.
30 gal. drums	4.50 gal.	4.90 gal.
55 gal. drums	4.00 gal.	4.40 gal.

Freight allowed on 10 gallons or more.

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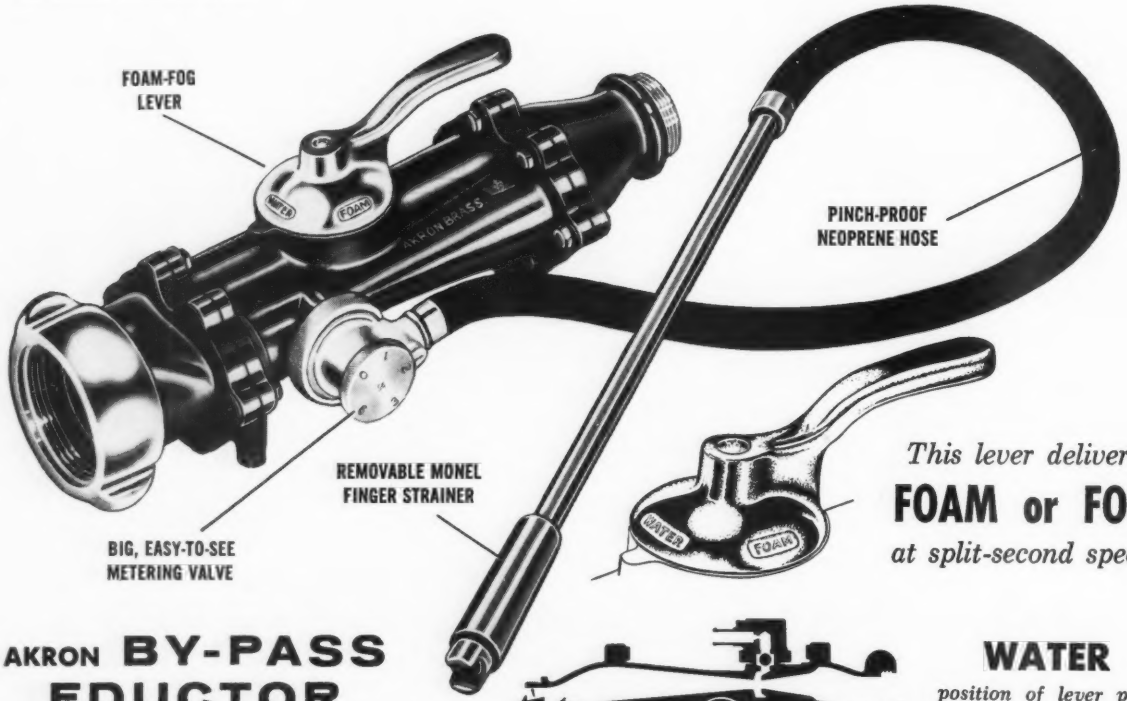
FIRE FIGHTING EQUIPMENT

AKRON IN-LINE EDUCTOR

Dependable, trouble-free pick-up, with minimum friction loss.

AKRON BRASS FOAM and WET WATER EDUCTORS

(PROPORTIONERS)



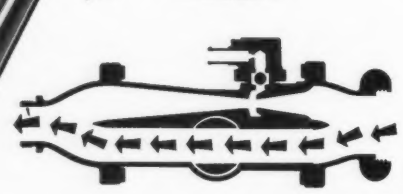
This lever delivers

FOAM or FOG

at split-second speed

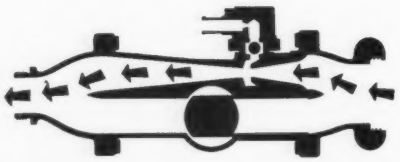
AKRON BY-PASS EDUCTOR

Now you can have foam or fog at split-second speed! With lever at "water" position you have water fog without eductor friction loss, or turn the lever for instant foam! Always ready for emergency foam production without shutting down or changing equipment. Here's how it works:



WATER

position of lever puts stream through by-pass, nozzle delivers full rated capacity.



FOAM

position switches water from by-pass through eductor, makes foam instantly!

The Akron Eductors now make it possible to keep wetting and foaming agents out of your tanks and pumps without high pump pressures. Akron Eductors may be used at the pumper or in the line. Generally, these units should be mounted at least one length back from the nozzle and not more than 150 feet from the nozzle for 1½" lines carrying more than 90 GPM and 2½" lines carrying more than 210 GPM, and not more than 300 feet for lines carrying lesser rates of flow. All sizes of Eductors will give 100 P.S.I. nozzle pressure at an inlet pressure of approximately 200 P.S.I. where Akron Imperial fog nozzles are used. Made in three sizes with four different inlet-outlet combinations, and five stock gallonages.

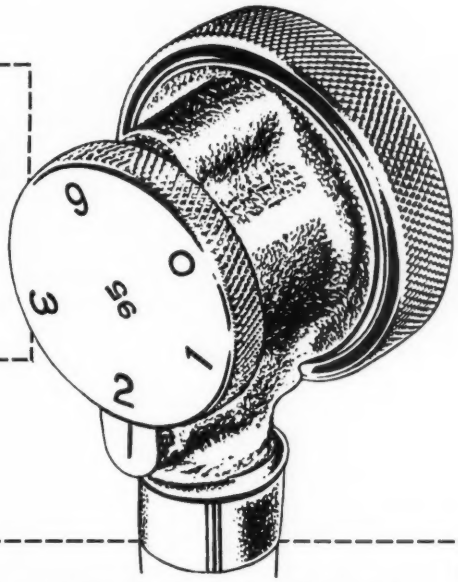
NOTE: All Akron Eductors may be operated at lower pressures, however, resultant nozzle pressures will be reduced correspondingly. It is essential that the Eductor and the nozzle shall match in GPM rating. Stock models match Imperial and Akron foam nozzles, and special models may be obtained to match any desired rate of flow.

All Akron Eductors Have

POSITIVE, EASY-TO-SEE METERING VALVE

Calibrated in direct percentages

A Positive Detent Lock Guarantees the Setting



BIG, EASY-TO-SEE METERING VALVE

calibrated in direct percentages. Positive detent settings assure accurate metering at all times.

SHUT-OFF AT METERING VALVE

makes it easy to shut off foaming or wetting agent without removing pick-up tube from container.

POSITIVE CHECK VALVE

prevents flow of water back into container in the event back-pressure develops.

TOUGH NEOPRENE HOSE

resists deterioration, spiral wire reinforced to prevent pinching. Stays flexible in cold weather.

Style	Size	Inlet	Outlet	Type	Matching Akron Nozzle	G.P.M.	Meter Calib.	Wt. Lbs.	Price W.B.*	Price C.P.**
2230	1"	1"	1"	In-Line	710-R	23	0-1-2-3-6	5½	$ 69.50	$ 79.50
2231	1"	1"	1"	In-Line	710-R	23	Fixed any %	5½	62.25	72.25
2600	1½"	1½" or 2½"	1½"	In-Line	715 3602	60	0-1-2-3-6	7	81.00	92.50
2950	1½"	1½" or 2½"	1½"	In-Line	715	95	0-1-2-3-6	7	81.00	92.50
2601	1½"	1½" or 2½"	1½"	In-Line	715 3602	60	Fixed any %	7	73.75	85.25
2951	1½"	1½" or 2½"	1½"	In-Line	715	95	Fixed any %	7	73.75	85.25
2120	2½"	2½"	2½"	In-Line	725 729 749 3120	120	0-1-2-3-6	11½	128.00	142.50
2240	2½"	2½"	2½"	In-Line	725 729 749	240	0-1-2	11½	128.00	142.50
2121	2½"	2½"	2½"	In-Line	725 729 749 3120	120	Fixed any %	11½	120.75	135.25
2241	2½"	2½"	2½"	In-Line	725 729 749	240	Fixed any %	11½	120.75	135.25
2608	1½"	1½" or 2½"	1½"	By-Pass	715 3602	60	0-1-2-3-6	21	----	180.00+
2958	1½"	1½" or 2½"	1½"	By-Pass	715	95	0-1-2-3-6	21	----	180.00+
2609	1½"	1½" or 2½"	1½"	By-Pass	715 3602	60	Fixed any %	21	----	172.75+
2959	1½"	1½" or 2½"	1½"	By-Pass	715	95	Fixed any %	21	----	172.75+

* Wire Brush Finish ** Chrome Plate + Chrome Plate Trim Only

Akron Brass Mfg. Company, Inc. • Wooster, Ohio

A metering valve that's easy to set:

- **0** *Shut-off, no pick-up.*
- **1** *1% solution of UNOX for all Class "A" fires for maximum smothering, cooling, and wetting, and is essential for burning sawdust, straw, and hay—baled goods, humus, etc.*
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- **3** *3% setting for use with Akron 3% DUBL-TUFF foam on Class "A" and "B" fires.*
- **6** *6% setting for use with Akron 6% DUBL-TUFF foam on Class "A" and "B" fires.*

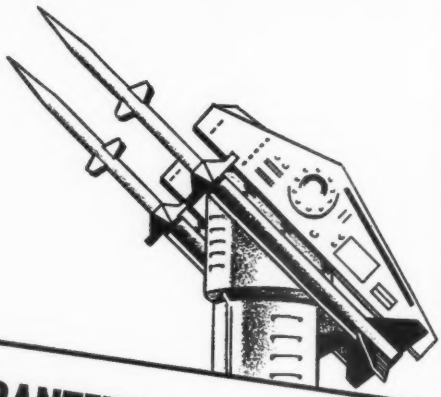
Special eductors can be designed to meet special conditions where lays must exceed recommended maximum distances.

Eductors described in chart match Akron Imperial and Dubl-Tuff nozzles. When ordering eductors for other nozzles, specify make of nozzle, size, gallonage and type of foam.

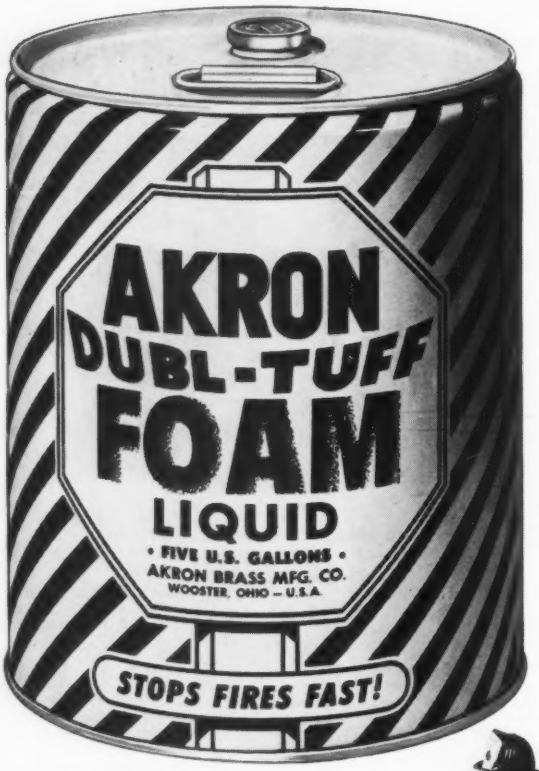
AKRON BRASS
FIRE FIGHTING EQUIPMENT

AKRON
DUBL-TUFF FOAM

Produces smaller, tougher bubbles— spreads over fires quicker



GUARANTEED* by Akron to be the finest foam available. It has extinguished rocket fuel fires where others have failed.



CLINGS TO ANY SURFACE, horizontal or vertical, forming a long-lasting, cohesive mass of small air-filled bubbles.

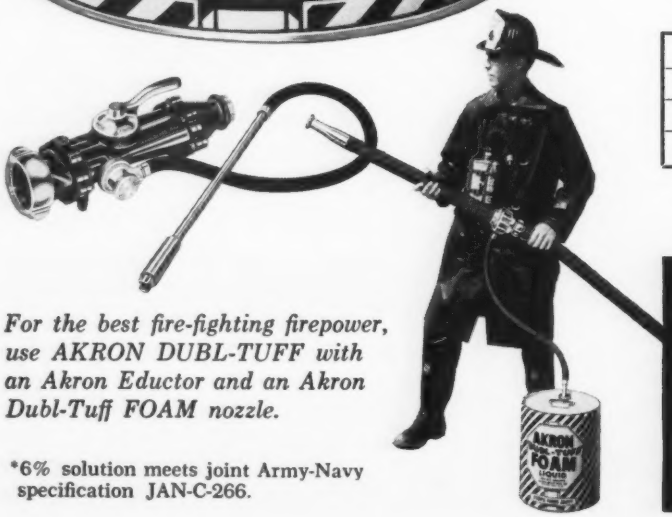
FLOATS FREELY on flammable liquid surfaces, has high water retention for maximum cooling and stability.

GOOD INSULATOR, it is effective in controlling flash-backs and for quick control of Class "A" and Class "B" fires.

RESISTS FREEZING, the 3% solution may be stored safely at temperatures down to 0 degrees F. 6% solutions withstand 10 degrees F. Special low temperature foams available on special request.

DOES NOT DETERIORATE with age, your supply is always fresh and ready to use.

Qty.	3%	6%
5 to 95 gals.	$5.50 per gal.	$4.00 per gal.
100-995 gals.	5.00 per gal.	3.50 per gal.
1000 or more	4.50 per gal.	3.25 per gal.



For the best fire-fighting firepower, use AKRON DUBL-TUFF with an Akron Eductor and an Akron Dubl-Tuff FOAM nozzle.

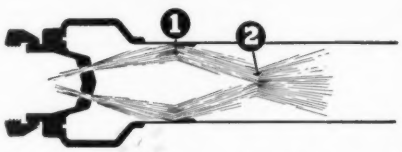
*6% solution meets joint Army-Navy specification JAN-C-266.

AKRON BRASS
FIRE FIGHTING EQUIPMENT

DUBL-TUFF FOAM NOZZLE

Better because:

- ***DOUBLE-BOUNCE JETS*** inject air *twice* for better foam.
- ***LONG RANGE PROJECTION*** — no obstructions in stream to steal pressure or cause friction loss.
- ***CLOG-PROOF*** — strainer and large jets keep nozzle working, even with dirty water.
- ***STURDY and LIGHTWEIGHT*** — won't tire the nozzle operator, yet built for rough service.



High pressure jets give "double-bounce," inject air into foam stream twice, doesn't lower pressure.

TWO TYPES:

Type 1 With pick-up hose, uses foam source at the nozzle. Neoprene hose resists deterioration, stays flexible in cold weather. Hose is reinforced with spiral wire to prevent kinking, assures constant supply of foaming agent. Hose connection O-ring sealed, only hand pressure is needed to attach. Cannot leak, pressure improves seal.

Type 2 (without pick-up tube) is used with a proportioner in the line, or at the pumper.

Both types equipped with Monel strainers, easily removed for cleaning Nozzle body wrapped with red marlin cord for insulated, sure-grip holding. Protective bumper at tip.

TWO SIZES: ★ 1½" nozzle for 600 GPM of Foam ★ 2½" nozzle for 1200 GPM of Foam when operated with 100 P.S.I. at the nozzle.

Choice of chrome or polished brass finish.

YOUR DUBL-TUFF FOAM TEAM

DUBL-TUFF foam *plus* an Akron IN-LINE or BY-PASS EDUCTOR *plus* an Akron DUBL-TUFF NOZZLE

Style	Size	Type	Gallonage	Dimensions	Weight	Price PB	Price CP
3601	1½"	Type 1	60 GPM	36¼" long	12½ lbs.	$ 74.00	$ 78.00
3602	1½"	Type 2	60 GPM	36¼" long	11 lbs.	57.00	60.00
3120	2½"	Type 2	120 GPM	41" long	15 lbs.	130.00	135.00

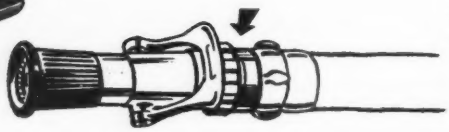
AKRON BRASS
FIRE FIGHTING EQUIPMENT

Akron Brass Mfg. Company, Inc. • Wooster, Ohio

What is the **GIZMO®?**

A compact **SHUT-OFF** *that works easily under highest pressures*

SHOWN 1½ TIMES ACTUAL SIZE

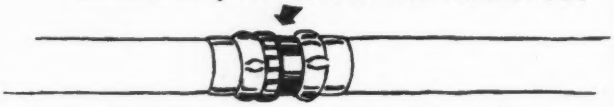


Why didn't someone think of this shut-off years ago? This simple little GIZMO makes *any* nozzle a break-apart, can be inserted just below the nozzle or anywhere in the hose line.

When you want to add more hose to your line, shut off with GIZMO, take your nozzle off, add more line and start up again. The nozzle retains all of its controls.

Makes *any* nozzle a better break-apart at a saving.

Attach it just below the nozzle...



...or anywhere in the hose line

MODERNIZE WITH FOAM

UNOX *plus* **AKRON EDUCTOR** *plus* **IMPERIAL NOZZLE**

SPECIFICATIONS:

Style	Size	Length	Wt.	Price
1	1½ x 1½	1⅞"	1 lb. 2 oz.	$12.50
2	2½ x 1½	3⅜"	3 lb. 7½ oz.	17.50
3	2½ x 2½	2¾"	3 lb. ½ oz.	19.50

AKRON BRASS
FIRE FIGHTING EQUIPMENT

Akron Brass Mfg. Company, Inc., Wooster, Ohio

If you're not using

AKRON VALVES

it's time you should

Discharge, suction, in-line . . . Akron makes a valve for every spot on your apparatus. Made in the same modern plant, with the same care as famous Akron nozzles and related fire fighting equipment.

Here's why it pays to specify AKRON valves:

PROOF TESTED and recommended for pressures to 1000 P.S.I.

CAPTURED SEAT is adjustable for wear with brass screw retaining ring. Can't chew up gasket, can't blow into hose line. Reduces wear on valve seat too, for longer life.

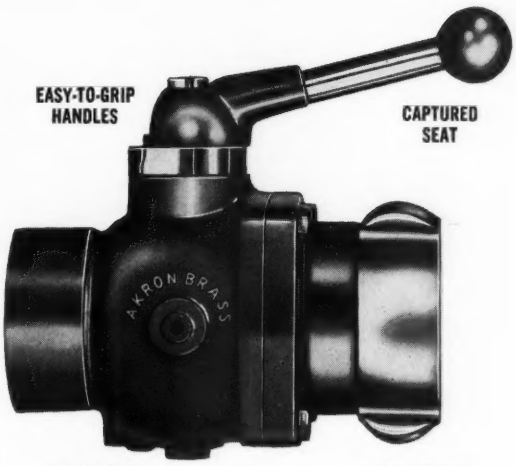
FULL FLOW WATERWAY delivers more pressure, reduces friction loss.

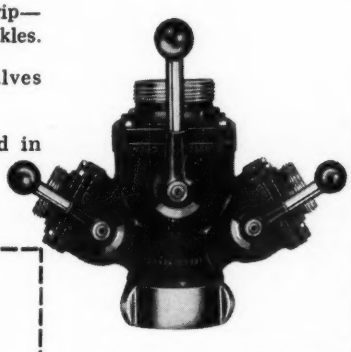
FIELD PROVEN by years of trouble-free service. Specified as original equipment by leading truck and apparatus manufacturers.

HUSKY HANDLES, easy to grip—turn without skinning knuckles.

EASY WORKING, Akron valves never "freeze" or stick.

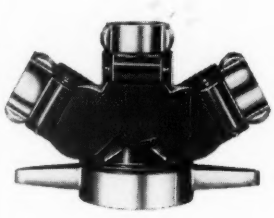
VACUUM—or pressure held in either direction.





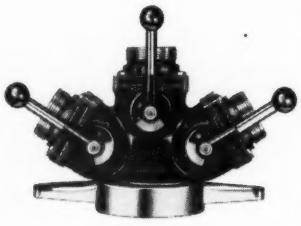
Style 273 WATER THIEF

Short, lightweight water thief of compact design. Use it with pre-connected lines, and in evolutions and hose lays previously thought impossible. Ideal for hydrant use, in hose line or at 2½" discharge gate on pumper. Permits addition or use of 1½" lines without shutting down 2½" line. Allows 2½" lines to be shut down and put away while clean-up continues with 1½" lines. Inlet is 2½" ball bearing swiveling female. One 2½" bolted flange male outlet, two 1½" bolted flange male outlets.



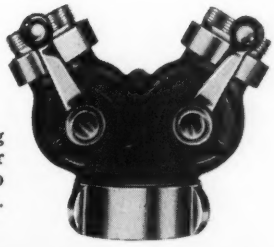
3-WAY SIAMESE

Style 257 (PLAIN).
Style 256 (CLAPPER VALVE).
Three 2½" swiveling female pin or rocker lug inlets, 2½" to 6" swiveling outlet with long handle or pin lug. Red valve body with chrome trim or polished brass.



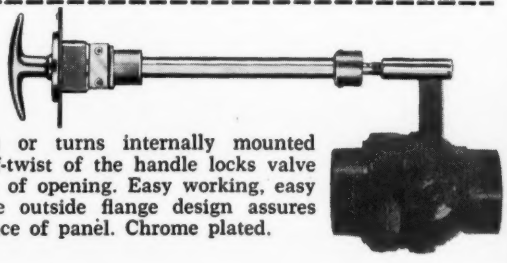
Style 582 3-WAY WYE

With quarter-turn ball valves. Available with 2½" through 6" female inlet, long handle. Three 2½" male outlets. Also available in pin lug, if specified. Red body with chrome trim or polished brass.



Style 481 LEADER LINE WYE

With 2½" swiveling female inlet, rocker lug or pin lug. Two 1½" male outlets. Full flow.



REMOTE CONTROL ARM

Pushes, pulls or turns internally mounted valves. A half-twist of the handle locks valve at any degree of opening. Easy working, easy to install, the outside flange design assures neat appearance of panel. Chrome plated.

AKRON BRASS
FIRE FIGHTING EQUIPMENT

Akron Brass Mfg. Company, Inc., Wooster, Ohio

Don't ruin your expensive pumper...

get an **AKRON SIPHON**

When you want to remove a lot of water from basements, ditches or excavations, use an Akron Siphon. Portable pumps and expensive fire pumpers were never designed to pump grit and foreign matter.

For years Akron Siphons have moved a lot of water at a lower cost than any other available equipment. Simple in design, there are no moving parts — nothing which can be injured by dirty, gritty water.

Operating on the principle of a transfer of energy from a high velocity stream of water to a more slowly moving column of water, Akron Siphons will lift 1,000 to 20,000 GPH at heights so great that no other kind of pump would even operate.

Hydrant pressure alone will work, or a pump may be used to pressurize inlet, speeding removal. Water removal is governed by amount of pressure applied and the adjustment of the jet tube. Just set tube for your pressure conditions, no further adjustment necessary.

SPECIFICATIONS

Style	Capacity	Size	Material	Weight	Standard Threads	Price
510	18,000 to 20,000 GPH	11" wide 18" high	Brass Akrolite Alloy	56 lbs. 14¼ lbs.	2½" Inlet National Standard, Iron Pipe, New York Corporation 4"-6" male outlet threaded iron pipe	Brass $286.00 Akrolite 234.85
515	4,000 to 6,000 GPH	10" wide 15" high	Brass Akrolite Alloy	25½ lbs. 10¾ lbs.	Inlet 1½" National Standard, Iron Pipe, Pacific Coast 2½" male outlet Iron Pipe	Brass $241.45 Akrolite 205.15
520	1,000 to 1,300 GPH	4" wide 8" high	Brass Akrolite Alloy	6 lbs. 2¼ lbs.	Inlet ¾" Garden hose thread Outlet 1½" Iron Pipe	Brass $101.20 Akrolite 83.05

Fastest removal of dirty, sludge-filled water at lowest cost.

AKRON BRASS
FIRE FIGHTING EQUIPMENT

Akron Brass Mfg. Company, Inc., Wooster, Ohio

Lieutenant Robert Kennedy, official photographer, Philadelphia Bureau of Fire, describes prize-winning photos used to build public good will to executives of Lumbermen's Mutual Insurance Company at company's conference

Wanted: A Public Relations Program to Build Fire Department Good Will

It's a day and age of publicity, promotion and propaganda. If business and politics can profit from them, the fire service can

By IRVING HIRSCHBEIN*

THE NATION'S FIRE SERVICE has almost completely overlooked one of the most important aspects of its operations—the relationship between the service and the community. The use of public relations techniques is almost unknown in fire department circles and as a result much of the good work of professional and volunter fire departments is failing to win recognition and support of the public.

If this baldfaced statement sounds a bit blunt, let's look at the record and see what is happening throughout the country.

It is hardly necessary to tell the readers of FIRE ENGINEERING that last year, for the first time in history, this country suffered a loss of over one billion dollars as a result of fire. Nor is it a secret that over 11,000 persons—mostly the very young and the very old—died in these same fires. Even a nation as rich as ours can't stand the draining of life and property on this scale for very long.

The story has an even grimmer aspect to those in the fire service who live with the sordid statistics every day of their life. The record loss has come at a time when the greatest efforts are being expended in the field of fire prevention. Certainly recent years have seen more money and time put into this worthwhile endeavor than ever before in our history. Yet even the staunchest advocates of fire prevention programs would hesitate to predict that there will be any sizeable reduction in fire losses in the immediate future.

Old-timers from Los Angeles Fire Department go for "last ride" on old horsedrawn rig on ABC-TV's "You Asked For It" program emceed by Art Baker. Los Angeles firemen have been cast in movies, radio and TV since the first "flickers"—*L. A. F. D. photo*

*Irving Hirschbein, the author, is an associate editor of *American Legion Magazine*, an experienced news editor and an avid fire buff.

Why? In the opinion of this writer, one answer lies in the failure of the fire service to acquaint the public with the dangers of fire and what is being done to combat these dangers. This is not a criticism of the fire prevention programs. Experts say that in the main, many of these programs are soundly conceived, and energetically carried out. However, the word has not reached the public—one of the reasons being because the fire service itself has no comprehensive public relations program to sell the idea of fire prevention and the important part played by the fire forces in the fire safety picture.

This failure to get its message to the public hurts the fire service in other respects, as well. We hear continuously of cutbacks in funds for fire departments. We find stories in national magazines advocating integrated fire and police departments. Recruitment of personnel is now almost a chronic problem in the fire service and the difficulties in the procurement of modern equipment and training facilities plague many chiefs.

These problems if not sired by, are at least kin to, lack of favorable public relations.

What are public relations?

Let's define what we're talking about. "Public relations," as this author sees it, is a well established technique used extensively in American business life. Essentially it is nothing more than telling the public who you are, what you are doing, why you are doing it, and, most important, convincing Mr. and Mrs. John Q. Citizen that it is something worthwhile for them.

Public relations—good and bad

There are excellent techniques in public relations that have been developed, tried and proven. It has become almost axiomatic that a well-planned, well-executed public relations program can sell the American public almost any truly worthwhile idea (with emphasis on the "worthwhile"). One good example of recent years is the highly successful campaign of the National Infantile Paralysis Foundation. The continuous and well-conducted program of this organization raised millions of dollars for care and treatment of victims and eventually brought forth the polio vaccine.

The same people who support this worthwhile cause would certainly join forces to reduce the waste from fire—if they were told about it and sold on it. They have to be convinced there is a need for fire prevention promotion and that the machinery for that promotion exists and their cooperation is needed.

We've already mentioned the effect of poor or non-existent public relations upon certain aspects of the fire service. We cannot reasonably expect our elected representatives to vote funds for a pig in a poke. Nor will the taxpayer—the familiar John Q. Public—support any program or project he does not understand. When it comes time to set up the annual municipal budget, you can be sure that the lion's share of available funds will go to those city governments and services that have best sold themselves to the public and its elected representatives.

Left: Youngsters and grownups alike thrill to the history of the fire service. Friendship Veterans Fire Company, Alexandria, Va., exhibits ancient engine presented the city by George Washington in 1784. **Right:** What makes for good public relations. Los Angeles City Fire Department Captain Darwin Neilsen holds puppy, one of 15 animals rescued from a fire which destroyed a pet hospital with $50,000 damage

We know that fire departments have not embarked upon a program to destroy public confidence in themselves. Yet, sometimes the manner in which they deal with the press and citizens makes one wonder what they are trying to accomplish. Public opinion wields tremendous power, and we can see all around us how industry, labor, political parties and social agencies try to win public support—and do! We also see the effects of poor public relations.

These groups and organizations that conduct good will building efforts use public relations techniques to gain acceptance of their programs and projects. They lay the groundwork for favorable acceptance of a price rise, or a new product or work contract, or candidate—whatever they wish to promote—by telling the public all about it in a carefully planned and executed campaign.

Experience has shown that a foremost essential in the development of successful fire public relations program is the right person—a man who combines a sincere interest in the fire service with a professional background in writing and moulding public opinion. Backed by the fire service organizations, such a man could build and carry through a sound, constructive promotional program for the fire forces of the country.

Study of the progress being made by a number of metropolitan fire departments indicates how much good promotional effort to build public good will has been responsible for their success. All the factors that go to make up this favorable promotion (call it good public relations, if you please), are known. There is no secret about it. And anyone who is willing to put forth the effort and small financial investment can do likewise.

Some public misconceptions

Anyone tackling the task of creating favorable public relations for a fire department will at some time run slap bang into misconceptions of what firemen and fire departments are; how they work, and why they do what they do. Some of these ideas and opinions border on the fantastic—some of them are natural conclusions drawn from what the persons have read, or heard, or seen.

Here are some sample misconceptions:

1. The most ancient one, of course, is that expressed in the old plaint the firemen destroy everything the fire doesn't

2. Don't call the fire department unless you're sure you have a fire (or the reverse—whatever your trouble is, call the fire department)

3. Firemen spend most of their time sitting around the firehouse "waiting for alarms"

4. The fire fighter's job is pretty soft—good pay (it doesn't matter what he gets, in the eyes of some it's high pay) . . . easy hours . . . good vacations . . . lots of side advantages like free transportation and big pensions!

5. Firemen are always speeding to fires . . . making more noise than is necessary

6. Firemen are always snooping around, sticking their nose into places where they have no right (usually heard from persons who are poor housekeepers, or who know they're violating some regulation)

"So what," you say. How does all this affect the department? Well, if the man who ultimately pays the bills knows so little of the basic facts, imagine his reaction to a proposal to buy a new pumper or aerial ladder truck costing thousands of dollars. "Why," he says, "the ones they have are still bright and shiny—no fire engine is worth that much."

Now try to convince him that the shiny pumper is more than 20 years old and obsolete, or that the ancient ladder truck that has no aerial ladder is an anachronism! It's too late to start pleading when the budget is up for consideration; the

men who protect the taxpayer from the dangers and horrors of fire should have so convinced these skeptics a long time before that the fire department deserves their support for all the men, money and equipment needed for good fire protection.

Skeleton of a public relations program

If we agree that there is a problem in the field of fire department public relations, what can we do about it? Here is an outline of a basic public relations program which most departments can follow. It is flexible enough to allow for local conditions that must of necessity be considered. More important is the fact that this suggested plan embodies the principles followed by industry, government and labor in selling themselves.

No program, however, is any stronger than the men who are assigned to carry it out. Unless they really believe in what they're doing and can approach the problem with enthusiasm and get the necessary support from above, it would be better not to tackle the task at all.

Objective: To gain public support and to create a favorable climate of public opinion for the local fire department problems and programs.

1. Establish a public relations bureau or section within the department. In small departments this can be a one-man operation. In larger cities, a staff organization is advisable.

Avoid criticism. Wherever possible assign qualified limited service men and officers to such a bureau or section. Wherever possible utilize men with newspaper or radio experience or college training.

If possible, have one or more men take a basic course in journalism at a local school or college, or ask the assistance of a newspaperman in training personnel. While your staff will not be expected to write long stories or articles, they should be able to prepare simple news releases. And be sure to enlist the aid of the press.

This sort of "cheesecake" still makes headlines. Miami (and other cities) annually pick "Miss Flame" to create public interest in Fire Prevention Week. This is Rhoma Berube, Miami's 1956 model

Apparatus field home inspections offer excellent opportunity to create favorable public opinion for fire departments, as well as detect dangerous hazards. Here a Berkeley, Calif., Fire Department team starts out

Include a photographer and an artist or cartoonist in the group if possible. If there is an official photographer in the department so much the better—make him a part of the public relations bureau. (See elsewhere in this issue of FIRE ENGINEERING).

2. Enlist the support of local groups such as service clubs, veterans organizations, school groups, clubs, auxiliaries and buffs. Let them know that you'll be happy to supply speakers, films and demonstrations for their meetings. They can help you get your message to the public.

3. Start small. Don't make your first effort one to get pay raises, shorter hours or a lot of costly equipment. First let the public know you exist. Make certain the press and radio know about every fire, deed of heroism, promotions, new equipment or policies, etc. They'll get your name before the people, whose good will you want and need.

Try to get the newspapers to carry feature stories about interesting men in the department; articles on how the department operates; what it is accomplishing; its standing among other departments; the progressive methods followed for training and fire fighting. You don't have to write such stories but you have to let the press know that the material is available for its use. Such stories are a good, indirect way of making the people who pay the taxes conscious of your value and more amenable to proposals calling for their moral and material support.

4. Keep at it. Public relations experts will tell you that any program designed to gain public or community support depends upon a continuing effort. Don't be misled by old-style press agentry which depends upon one cyclonic "stunt" or circus-like effort to convert the public 100 per cent for you.

The low-pressure salesman of today does far better, in the long run, than the high-pressure put-your-foot-in-the-door peddler. You can't do a real job in one month or even one year; the effort must be continuing and long-range. Once your department is established favorably in the public's mind, when an emergency arises you can implement a short-duration promotional drive to gain an immediate objective.

Public relations programs are frequently started to overcome an unfavorable picture that has grown up in the public's mind. Part of any fire service public relations program will have to take into consideration some unfavorable views the taxpayer has of the fire service.

There's an old saying that everyone knows how to run a railroad or a hotel. Sometimes he thinks he can run a fire department, too. At least the patrons are always ready with free advice! In a sense they're right. Not being involved in the operation, the customer can quite often see something that would improve the picture. To help you get started on your public relations program, here are some of the things your "customer," the taxpayer, sees that irritate or annoy him.

- Firemen sitting on benches in front of the fire house; some departments forbid it. Keep the men out of sight, except for the man on the watch desk and those who are busy, and show it.

- Unshaven and sloppily garbed men in dress uniform. Wear the uniform with pride and correctly, or not at all.

- Failure to cooperate with the press. This affects only a handful of men directly—the reporters—but indirectly you hurt yourself with the entire public. Certainly you're busy at a fire, but if you ask the reporters to wait for a few minutes until you can talk to them, or have an officer assigned to give them the details, they'll be on your side. Don't force the news reporters to rely on a police officer or some other person outside the department to supply details of the fire you're fighting.

If your department has a policy that prevents its forces from responding to certain types of non-fire emergencies such as a cat up a tree; flooded home basements, or people locked in bathrooms, make sure the public knows why you do not respond. Make sure it is known why you won't jeopardize men and equipment; you'll find the average citizen sympathetic and understanding.

Vamps need good will too

The problem of public relations for volunteer departments is fully as vital a one as it is for paid departments. Generally

Continued on page 776

Training in protective breathing equipment must be thorough. Here Miami, Fla., training officer instructs students in proper method of donning face piece—*Miami F. D. photo by C. H. Mertens*

Training Fire Department Rescue Personnel

Demands on fire service rescue and emergency forces are increasing in number and scope . . . Training of fire department personnel should be intensified and broadened to meet these expanding needs

By DONALD M. O'BRIEN

AMONG THE MANY SKILLS which the average fireman acquires as a result of his training and experience is a facility in dealing with emergency situations which involve peril to members of the fire department as well as persons of the community. These are referred to as rescue techniques. An exact definition of the term "rescue" as it applies to fire department emergency operations, is difficult to establish because the service and functions performed under the title vary widely throughout the nation.

The emergencies to which firemen are called may range from first aid for cuts and bruises, to forcible entry for the purpose of releasing children locked in bathrooms; or to the more complicated and serious problems of removing injured workmen from lofty heights or deep excavations, etc. All of the foregoing may be classified under the term rescue in various parts of the country depending upon the scope of each individual fire department's operations.

In areas where rivers, ponds and lakes are frequented by the citizens, either for recreation or commerce, firemen are frequently called upon to remove unfortunate victims from the water and attempt to revive those thought to have been drowned. This type of operation is also included under the category, and training for such emergencies forms an important part of the curricula of many fire department schools.

There is an old quotation in the fire service that there are never two fires alike. The same can be said of rescue. Because of this factor a great deal of study, research and planning must be given to all phases of such operations in order to thoroughly ground all personnel in the basic procedures which may have to be used at any time.

Originally rescue operations were included in the training curricula of many fire departments for the purpose of equipping the manpower with the necessary knowledge to effect rescue of firemen who had been overcome by smoke, heat and gases at fires and to effect the removal of those men who were trapped in buildings during fire fighting operations.

Because of the nature of the fire service and its readiness to respond at any moment, day or night, it became evident that the same techniques could be employed as a community service to assist citizens in need of help during private or public emergencies not necessarily connected with fires. This has led many departments to give greater recognition to rescue in the over-all training program.

Selecting manpower

Training can be defined as instruction in a series of mental and manual procedures necessary for proficiency in an art or task. In order to prepare firemen for the added duties expected of a rescuer, it is necessary that each man be given a thorough grounding in the fundamentals of first aid and rescue. These techniques, when added to the skills and practices acquired in his chosen profession of fire fighting, can then be expected to fit him mentally and physically for the work involved.

Training methods employed by the

various fire schools depend to some extent upon the operational procedures practiced by the fire department. In the average community it is a common practice to give each man sufficient rescue training in order that any company may be dispatched in case of need. This is sometimes referred to as light rescue, in that it is limited to those operations which may be undertaken and successfully accomplished with the equipment and manpower found on the average fire department vehicle.

In those departments which maintain special squads for the sole purpose of rescue, the operations which can be accomplished are accordingly much greater in scope, and the candidates for the company are usually selected from men who have qualities to fit the special needs.

Miami, Fla., for example, selects its squadmen from the ranks with a minimum of three years fire fighting experience required. Memphis, Tenn., trains volunteers from the regular fire fighting complement for a period of six weeks and then selects those best qualified.

Columbus, Ohio, gives potential rescue personnel experience by assigning them to ride with a squad during regular tours of duty. The method affords the squad commander an opportunity to observe each individual in action; an important consideration in determining the final selection of personnel.

First aid universal

One common factor which marks nearly all rescue work is first aid training. Emergency first aid goes hand in hand with rescue; in fact it is difficult to define exactly where one begins and the other ends.

First aid is important in rescue work because firemen must be trained to recognize the symptoms of serious injury, and attempt to alleviate the condition of a victim before removal to a safe place. If this is not done, the act of rescue, in itself, may cause further damage to the injured person or even endanger his life. It has also been said that a person in need of rescue requires first aid if for no other reason than for treatment of shock.

Practically every fire department teaches its members the standard American Red Cross first aid course and requires refresher courses at intervals. In addition, a large number give advanced courses to all firemen. Still further, nearly all rescue company officers are rated as instructors and in some cases, all squad men are so trained. Chicago alone, has over 300 first aid instructors in its ranks.

Hospital aid training

To meet the various situations which constantly face the rescuer, a number of departments supplement this instruction with more detailed schooling. Toledo, Ohio, uses the Academy of Medicine for lectures by doctors who are specialists in the fields of heart attack, convulsion, epilepsy, childbirth, broken bones, etc. In addition the county coroner instructs on deaths and special procedures to be followed by the men in case of suicides, murders, etc. In general these sessions consist of short lectures followed by question and answer periods.

Columbus, Ohio, follows a similar pattern and makes use of the facilities of Ohio State University Hospital.

When the City of Los Angeles began its ambulance service in 1957, a group of 82 men were trained by staff doctors of the Central Receiving Hospital in first aid, diagnostic techniques and emergency ambulance operations.

The men also attended lectures and films on emergency obstetrics. Finally the county coroner gave all men special training and has authorized them to ascertain death.

Omaha, Neb., squadmen are trained by members of the Douglas County Medical Association and are permitted to use laryngoscopes and administer narcotics.

Special hazards peculiar to a given area are also stressed. San Diego trains its members in the treatment of snakebite and carries special kits for the purpose on 92 per cent of its apparatus. The greatest danger from this source is during canyon fires when the firemen themselves are constantly exposed.

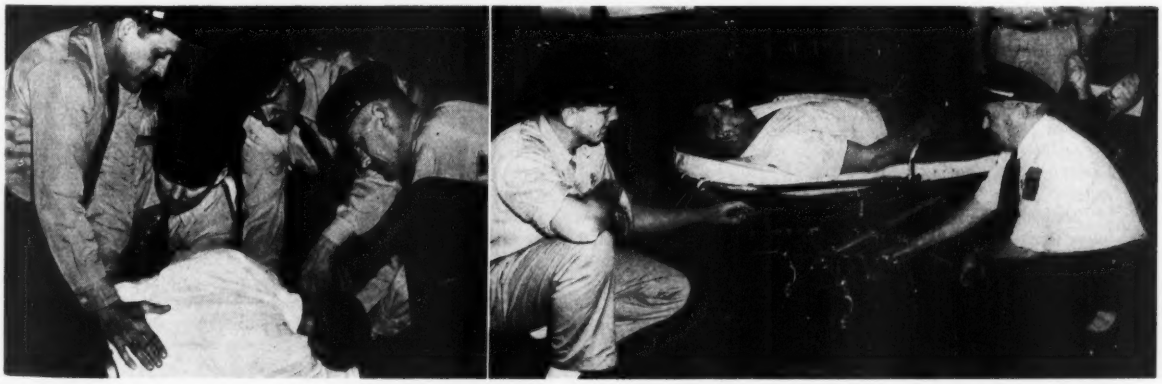
First aid training in the past has been limited to practice on dummy or live persons simulating a "victim." Other than mechanical repetition for perfection of techniques, the method did little to stimulate the trainee.

Injury moulage adds realism to first-aid training. Victim may control flow of blood for pressure-point practice as well as proper bandaging—*Alderson Laboratories photo*

A recent introduction, the "injury moulage," now permits a very realistic training problem, complete with visible "injury" and flowing "blood" on a "live" victim. The reaction of the squadman to such realism and the technique employed in dealing with the injury can be observed by the instructor and corrections made on the spot. The rubber and plastic moulages were first developed for training armed forces first aid personnel and are now available for general use.

Training for water accidents

Red Cross techniques are also widely used by fire departments which are continually faced with water rescue problems. Those methods are supplemented by local procedures which have been found suitable for the area (FIRE ENGINEERING June 1956) and are frequently employed in conjunction with boats. The addition of the latter equipment to rescue squads creates a need for additional train-



Left: Basic training of every fireman should include all methods of resuscitation and inhalation. Here members of Milwaukee Rescue Squad prepare training victim for artificial respiration—*Milwaukee F. D. photo by Fred E. Stanger*

Right: Stretcher techniques will vary with the introduction of new type carriers, therefore continual training is advisable—*Bomgardner Mfg. Co. photo*

Lowering victims from heights calls for familiarity with diversified tackle and first-aid devices, as is shown by this practice use of fracture board with victim secured by heavy-duty straps—*Medical Supply Co. photo*

ing in proper boat handling and maneuvering. All water operations require careful selection of personnel in order that men who are confident and capable yet aware of the hazards are available.

Fire departments have been quick to adopt skin diving techniques for its rescue operations. Shallow water diving equipment is growing in importance as an aid for water rescue techniques and departments presently equipped are devoting additional time to training in its use.

When such apparatus is not available, emergency substitutes such as the demand-type masks have been employed with success. Toledo, Ohio, drills its members in diving techniques at a convenient swimming pool, employing the same self-contained protective breathing masks normally used in fire fighting.

Light rescue

The emergencies most frequently encountered by the average fireman comprise those situations which can be readily handled with the tools and equipment carried on normal fire department apparatus. Training for such duties most often is carried out at the department drill yard and in company quarters, and in general, entails only practices of manual and mechanical procedures supplemented by lectures.

This training normally includes the use of hand and power tools for forcing entrance, cutting wood, metal and masonry; the operation of specialized tools for freeing victims pinned by overturned machinery, etc., and the rescue of conscious and unconscious persons.

The latter requires practice in the use of fire nets to catch persons jumping from heights, raising and climbing ladders for reaching heights, lifting and carrying stretchers for removing victims, and facility with ropes.

While all firemen are expected to gain familiarity with the use and application of ropes and knots, the rescue squadman should be trained in such a manner that his dexterity with them approaches or equals that of a rigger.

Top: Power tools simplify many otherwise arduous forcible entry operations. Hydraulic tools are being used by Minneapolis rookies to open wedged door during training session—*Minneapolis F. D. photo.* **Bottom:** Tunneling and shoring operations are best taught by actual field practice as demonstrated by these Omaha, Neb., firemen using drill school mock-up designed for rescue training—*Omaha F. D. photo by Dan Mulcahey*

Personal protection and safety should not be forgotten at any time. The squadman must be taught building construction in order to more easily detect dangerous building conditions and at the same time the hazards of contaminated atmospheres and how to protect himself and the victim from them. Mask training and the proper application of emergency oxygen equipment must be so thorough that each man becomes an expert in the field.

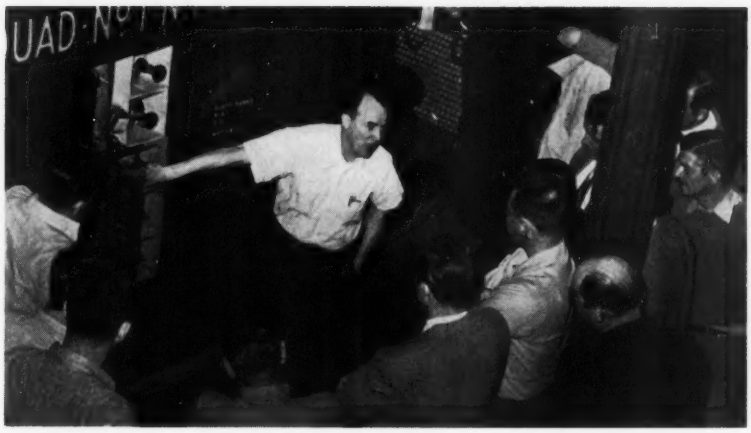
The possibility of building collapse, cave-in and explosion damage requires training in rescue techniques which are more difficult to teach without specialized training facilities. This type of emergency, frequently referred to as "heavy rescue," requires equipment not normally found in the average fire department complement of tools which are immediately available on fire fighting apparatus. Many departments maintain special files which show the location of tools and machines suitable for the tasks among the public works department, highway department, building contractors, wreckers, etc., in order that it may be obtained on short notice.

Practically all of the methods employed have been developed through local experience, by the Bureau of Mines, or through wartime experience in England and other countries.

It is possible to simulate on the department school grounds many of the conditions necessary for proper training in the techniques required, and a number of fire departments use the method successfully. In addition, available sites within a community may be used to advantage, such as condemned buildings slated for demolition.

The emphasis on civil defense rescue training has led many fire training officers to take advantage of both the manuals available for instruction purposes and the physical training sites which are designed for teaching good practices in searching for persons trapped under debris, locating, removal and similar specialized operations. Included are the techniques of tunneling, shoring, bridging and rigging.

The facilities required are duplicated in many areas of the country based upon the recommendations of the Federal Civil Defense Administration. The allocation of federal matching funds for such training installations has stimulated their construction and some fire departments have taken advantage of the program as a means of facilitating their instruction programs.



Knowing the location of all first-aid and rescue equipment on the emergency vehicle is as important as knowing its use. In this informal session, Newark, N. J., instructor points out location of oxygen devices—*Newark F. D. photo*

Transportation emergencies

Fire departments are frequently called upon for assistance following accidents on highways, railroads and on or off airports. Many of the techniques employed in rescue work in such emergencies are combinations of what has been termed light and heavy rescue. It can be expected that this type of emergency will increase in the near future as the result of this country's 40-billion-dollar highway program.

Protecting and removing trapped persons as a result of highway accidents may be simulated in some fire schools by means of a junked auto or truck, and a dummy. This is most often combined with fire fighting and first aid as it can be expected all three will be required for an emergency of this nature. The use of the hydraulic rescue tools for spreading twisted automobile framework to facilitate removal of victims from wrecks of this nature has become common in the rescue service and many departments include this as important training.

Fire departments are sometimes called upon to rescue persons involved in railroad accidents. Boston, Mass., for example, includes in its rescue manual a full section on the problems of rapid transit safety and rescue procedures. Protection of the rescue personnel is an important consideration in accidents of this nature, as the possibility of electrical shock is always present.

As part of its training program, Boston squadmen take regular field trips to the railroad and rapid transit installations in order to become familiar with the hazards involved and possible solutions of the many problems presented; the same procedures are extended to other high-hazard areas of the city.

Aircraft crash techniques are stressed by many organizations serving the fire protection field. Much of the information currently in use is the result of U. S. Air Force research and a great deal of training is based upon their findings. Many fire departments, located in proximity to air bases, have taken advantage of the facilities of the Air Force and have held training sessions for their men utilizing the military instructors.

The rapid increase in the number of private aircraft has stimulated many departments to train for any eventuality which may result from this source.

Related training areas

There are many additional areas where training is required. Some are specific in nature and others are intangible, requiring a good background of experience and the exercise of good judgment on the part of the officer in charge.

One of the intangible, and yet most important, practices is size-up or the survey of a situation to determine the necessary steps to be taken to effect rescue.

Size-up is just as important in coping with emergencies as it is to the fire officer in fighting a blaze. Size-up will determine such details as the best method of releasing a victim, places and means of entry, moving of debris, etc., and the determination of procedures to prevent further injury or disaster to the victim.

Field trips, blackboard drills and critiquese of previous emergency operations may be used to advantage in training for this very important area.

Los Angeles County uses the "situation-type" of training for its men once the fundamentals have been taught. In this method the instructor lays out a given situation, possibly connected to a previous rescue, and the students are then required to solve the problem with most appropriate procedures taught in the school. During the classwork the instructor constantly checks to assure that the operation will proceed with proper safety to the rescue personnel; visual aids are used extensively.

Rules and regulations

To obviate possible legal or other repercussions which may eventuate as a result of rescue operations, all members should be instructed in the limitations and liabilities of the service; careful thought should be given to setting up rules and regulations, which should be clear and concise. Some departments enlist the aid of the community legal counsel in this detail.

In the same category, department limitations on the use of certain types of equipment should be a subject of study and training.

The proper procedures for handling chronic respiratory cases and communicable diseases are a hazard facing firemen at all times and should be taught to the rescue personnel.

Additional training aids

In addition to training given in the department school, there are outside sources such as the previously mentioned Bureau of Mines and Civil Defense, which can provide specific rescue training services and supplement that provided by the community.

Newark, N. J., for instance, conducts training classes in the subject in cooperation with the Essex County Vocational and Training Schools. Columbus, Ohio, sends several of its members to the annual Rescue Squad Section, Ohio State Fire School, in order to keep abreast of the latest developments in the field. Many state and area schools have included the topic of rescue on their agendas.

In the Los Angeles area, Harbor Junior College offers rescue practice courses which have been attended by over 200 firemen annually from Los Angeles City and County as well as 15 neighboring cities. Instructors are experienced fire officers and the course covers practically all rescue subjects.

Manufacturers' representatives and engineers are also a valuable source of detailed information. The great majority of these men are acknowledged experts in their particular fields, and are available for assisting in the technical phases of particular rescue operations.

The rescue squadman can also increase his knowledge of the subject by referring

Continued on page 784

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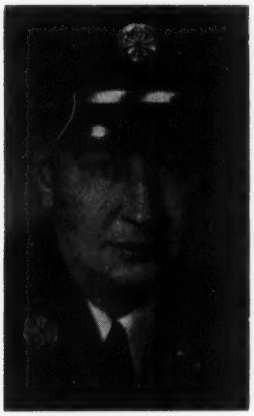

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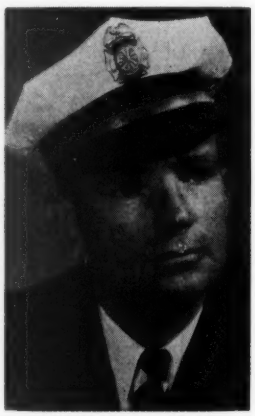

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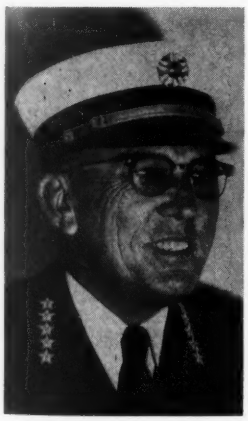

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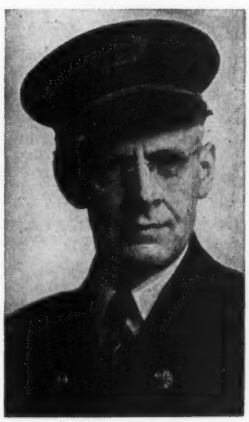

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Missouri Valley Fire Chiefs Hold 17th Annual Meeting

The Missouri Valley Association of Fire Chiefs held its 17th annual conference at the Hotel Antler's, Colorado Springs, Colo., June 2-4. Chief Fred H. Lausch of Colorado Springs presided at the three-day meeting.

Technical sessions on the first day included an address by Warren Y. Kimball, manager, Fire Services Department, National Fire Protection Association, and forums which discussed rating of cities; IAFC Newsletter, marking dangerous materials, training programs, state fire schools, extra-curricular activities, and storm warning signals. First Vice President Russel D. Salak acted as chairman. The day closed with a lively panel on integration of fire and police, moderated by retired Chief G. R. McAlpine of Oklahoma City.

Tuesday morning's session included addresses on "Cooperation Between Police and Fire Departments," by Police Chief I. B. Bruce, Colorado Springs; "Practical Uses of Atomic Energy," by Dr. Joe Lewis, Colorado Springs; "New Burn Therapy," by Harry S. Cook, Mallon Div., Doho Chemical Corp.; and "Improvements in Fire Apparatus and Equipment Design," by Hugh Walker, American LaFrance Corp.

During the afternoon the guests watched a crash demonstration at Petersen Field by the Ent Air Force Base fire fighters, under the direction of Chief William H. Mitchell, and a demonstration on fire-retardant paints directed by Gerald E. Misner, Albi Manufacturing Corp. The day was climaxed by the annual banquet held in the Terrace dining room.

Wednesday's session opened with an illustrated lecture on "Fires, Fire-Resistive Construction and Carbon Monoxide Gas," by Joseph L. Antonio, mechanical inspection supervisor, Denver Building Department. A business meeting followed, at which a resolution opposing integration of fire and police was adopted unanimously.

The officers elected are: President, Assistant Chief Russel D. Salak, Schuyler, Neb.; first vice president, Chief Fred Saefke, Fargo, N. D.; second vice president, Chief Eugene Fields, Omaha, Neb.; Chief Ray Tiller, Waterloo, Iowa, was again re-elected secretary-treasurer and director, IAFC.

Following adjournment, all members and guests were taken on a tour of the new United States Air Academy.

The 1959 conference will be held in the Baker Hotel, Hutchinson, Kans., June 9-11.

PROGRAM

I.A.F.C. Conference, Los Angeles, Calif.

Sunday, September 14

10:00 a.m. Registration—Biltmore Hotel
2:00 p.m. Board of Directors Meeting—Biltmore Hotel

Monday, September 15

10:00 a.m. Registration—Biltmore Hotel
10:00 a.m. Pacific Coast Inter-Mountain Association of Fire Chiefs Meeting, Chief Keith Klinger, presiding
12:00 noon Jay W. Stevens Get-Together Luncheon for members and their Ladies—Biltmore Hotel
6:00 p.m. Board of Directors' Meeting—Burbank Fire Department Headquarters, Chief William Taylor, Host
8:00 p.m. Fire Service Films—Biltmore Hotel

Tuesday, September 16 (Chief Donald S. Charles, presiding)

9:00 a.m. Registration—Shrine Auditorium
9:00 a.m. Exhibits—Shrine Auditorium
9:30 a.m. Opening Session and Memorial Services
1:30 p.m. Technical Session
1:40 p.m. **Significance of the Fire Service**—W. Ballentine Henley, M.D., D.O., president, College of Osteopathic Physicians and Surgeons, Member of Water and Power Commission, Los Angeles
2:25 p.m. **Yardstick of the Fire Service**—Panel Discussion with Chief P. C. Pifer, Bakersfield Fire Department, Moderator; John Colton, District Engineer, Board of Fire Underwriters of the Pacific, Los Angeles; Carl Weers, Assistant Chief Engineer, National Board of Fire Underwriters, San Francisco; J. T. Silveira, Assistant Chief Engineer, Pacific Fire Rating Bureau, Los Angeles; Carl Thornton, City Manager; Santa Ana; Chief G. R. McAlpine, Oklahoma City; Chief John Garthe, Santa Ana, Calif.
3:30 p.m. **Arson Committee Report,** William D. Rossiter, Chairman
3:40 p.m. **Boy Scout Committee Report,** Chief Albert W. Kimball, Chairman
3:50 p.m. **Civil Service Classification Committee Report,** Henry J. McFarland, Chairman
4:00 p.m. **Communications Committee Report,** Roi B. Woolley, Chairman
4:10 p.m. **Constitution and By-Laws Committee Report,** Fire Marshal W. J. Scott, Chairman

Wednesday, September 17 (Chief R. C. Malmquist, presiding)

9:00 a.m. **Our Non-Military Defenses**—the Hon. Leo A. Hoegh, Director, Office of Defense and Civilian Mobilization, Washington, D. C.
9:45 a.m. **Needs of the Fire Service**—Panel Discussion with Chief James Sweeney, Oakland, Calif., Moderator; Chief William Murray, San Francisco; John C. Thornton, A.I.A., Chairman, Committee on Human Safety, American Institute of Architects, Royal Oak, Mich.; Miles E. Woodworth, Flammable Liquids Engineer, NFPA, Boston, Mass.; Chief Wayne E. Swanson, Rockford, Ill.; Emmett T. Cox, Senior Field Officer, Fire Prevention Department, Western Actuarial Bureau, Chicago, Ill.
10:45 a.m. Fire-O-Rama Announcement — Assistant Chief Arthur Fowler, Los Angeles Fire Department
10:50 a.m. **Fire Administration Training Committee Report,** Fire Marshal W. J. Scott, Chairman
11:10 a.m. **Fire Prevention Committee Report,** Chief J. W. Stevens, Chairman
11:30 a.m. **Report of Committee on Nominations and Elections**
12:45 p.m. **Fire-O-Rama**—Los Angeles Coliseum
Trip to Disneyland and Barbecue

Thursday, September 18 (Chief A. H. Lintelman, presiding)

9:30 a.m. Business Session
9:40 a.m. **The New Age of Science and the Fire Officer**—Dr. Leonard C. Silvern, Advanced Scientific Education in Personnel, Hughes Aircraft Company, Los Angeles, Cal.
10:15 a.m. **Fire-Police Integration—Current Trends**—John D. Holstrom, Chief of Police, Berkeley, Calif., and President, International Association of Chiefs of Police.
10:55 a.m. **The Fire Hazards of Materials**—James J. Duggan, Director of Safety and Fire Protection, Union Carbide and Chemicals Company, Charlestown, W. Va.
11:30 a.m. **Fire Research Committee Report,** Chief C. Gray Burnett
11:40 a.m. **Latin-American Advisory Committee Report,** Chief Raul Gandara, Chairman
11:50 a.m. **Membership Committee Report,** Chief G. R. McAlpine, Chairman
1:25 p.m. **Team Plan—Civilian and Military Fire Services**—J. W. Ailes, III, Rear Admiral, U.S.N., Director, Shore Establishment and Maintenance Division, Office of the Chief of Naval Operations
2:00 p.m. **Our Largest Fire Force**—Panel Discussion with Warren Y. Kimball, Manager, Fire Services Department, NFPA, Moderator; Ray Hill, Fire Marshal, Los Angeles; Chief Cornelius Adema, Grand Rapids, Mich.; Chief James W. Johnston, East McKeesport, Pa.; Assistant Chief Leon Rasmussen, Midvale, Utah; Chief Ivan Pearson, McMinnville, Ore.
3:20 p.m. **President's Advisory Committee Report,** Hugh Walker, Chairman
3:30 p.m. **Radiological Hazards Committee Report,** Mathew W. Braidech, Chairman
3:45 p.m. **Publications Committee Report**
8:00 p.m. Banquet—Dinner Dance

Friday, September 19 (Chief Donald S. Charles, presiding)

9:30 a.m. Business Session
10:00 a.m. **Exhibit Committee Report,** Chief L. C. Canning, Chairman
10:10 a.m. **Fire Apparatus Committee Report,** Roi B. Woolley, Chairman
10:20 a.m. **Resolutions Committee Report,** Chief Reg. Swanborough, Chairman
10:40 a.m. **Training Committee Report**
10:50 a.m. Action on committee reports, installation of officers

Instruments to Ferret Out Hidden Fire and Explosion Hazards

Is the fire service making sufficient use of modern scientific instruments in its fire and explosion control operations? Many believe not. This brief report may help to point the answer

A SPECIAL FIRE ENGINEERING STUDY

New York fireman, Irving Purisch, uses Geiger counter to check premises at scene of chemical explosion where radioactivity was suspected

TODAY'S FIRE FIGHTER must make fullest possible use of the most modern, scientific tools and equipment in his never-ending fight with fire. This is particularly true because of (1) the unusual, fast-starting and spreading types of fires we are having and (2) the manpower shortages in our fire services.

Not only are we having more serious, costly fires, but we are having more deadly fires—deadly not only to the public, but to the fire fighter. And a dead or injured fire fighter is of no use to his community and his fire department. A study of the statistics of injuries to fire fighters indicates that a large percentage are caused by explosion of gases or the inhalation of toxic and poisonous fumes.

In many instances these injuries were due to lack of knowledge of the accumulated gases, their nature, extent and severity. This is particularly true of below-ground-level fires; fires in concealed spaces, etc. It is also disclosed that the majority of these are received during opening up, ventilating and overhauling.

The gases encountered are many and varied and their number is growing daily. Under today's conditions of fire extinguishment, the fire fighter cannot always rely upon his own powers of sight, smell, touch and hearing. Many explosive gases are invisible; some are nearly odorless; some attack the respiratory tract, some the skin, without warning. Under these conditions the fire fighter must either run the risk of the fire getting away, should he take safe, precautionary steps where he believes, or has been told, dangerous gases lurk, or he must count upon mechanical means of locating and identifying the hazardous gases before continuing operations.

As is described elsewhere, today's fire fighter has a wealth of protective equipment to help protect him, that is, except in one vital item. He has the most scientific masks and breathing equipment; he has fire-repellant and protective clothing, and devices such as shields, goggles, etc. But he has no assurance that the premises he is entering are not primed for explosion and quick-spreading fire.

To fill this gap, he is coming more and more to rely upon mechanical devices for locating and measuring these hazards. He is finding new uses for the instruments presently on the market, and he is working with the nation's leading manufacturers to develop and perfect new mechanical devices. The advent of atomic fission and related radioactive hazards has lent much impetus to this endeavor (This story was told in FIRE ENGINEERING, February 1957, November 1957 and February 1958).

Methods of protection

The fire fighter's normal protective clothing affords a good measure of protection from everyday hazards. The turnout coat, gloves, boots and helmets, in addition to providing protection against the elements, also tend to ward off the effects of many irritants or contaminants with which he may come in contact. Add to proper clothing adequate respiratory protection, as is provided with present-day masks, and about all the fire fighter lacks is something that will warn him of those conditions which call for the use of these safety features.

Nearly all the atmospheres which firemen may encounter will contain some proportion of combustible or explosive gases. In order to safeguard their own lives as well as the lives of others, it is important for them to know the degree of risk involved. Fortunately there are instruments available, basically all operating on the same principle, which will quickly provide the necessary information.

Let us quickly review the more important of these instruments.

Combustible gas indicator

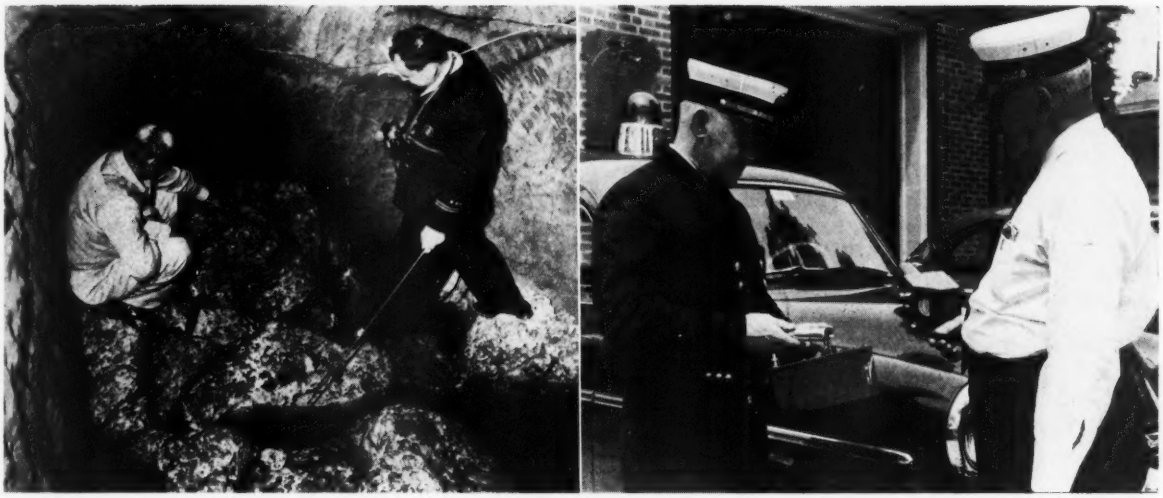
There are a number of small instruments known as combustible gas indicators, carried by hand or suspended by straps from the shoulder, which can be taken close to a suspected area and by means of simple operations, visibly display on a meter dial the potential explosion danger of the atmosphere.

The device uses the principle of an electrical resistance bridge and measures the amount of disturbance in the circuit depending on changes in resistance caused by burning of the sampled atmosphere. A special flame arrestor prevents any flash-back to the atmosphere.

In operation, a tube leading from the instrument is placed in the suspected area and a bulb squeezed by the hand of the operator, aspirates a sample of the atmosphere into the chamber of the indicator. The collected sample contacts a hot platinum wire filament. If an explosive gas is present, catalytic action occurs and rapid combustion results. The added heat raises the temperature and resistance of the wire filament, causing a circuit unbalance which is recorded on the meter.

With an increase in the amount of combustion, a corresponding increase in the wire resistance results; this is calibrated on the face of the meter and by noting the meter hand position, it is possible to determine not only if a potentially explosive and hazardous gas is present, but whether a sufficient quantity is present within the explosive limits.

If none is present, the meter balance is undisturbed and no indication or movement of the meter hand will result. If a heavy concentration is in the atmosphere, and is therefore too rich to burn, the meter will indicate this condition by first



Left: Dallas Fire Captain W. C. Miller uses detection instrument in pit to determine presence of hazardous gas. **Right:** Chief John Steede and Deputy Chief Fred Flood, Waltham, Mass., Fire Department, discuss appropriate instruments for possible use at fires involving the 11 locations in the community where radioactive material is used—*Tracerlab Inc. photo*

swinging immediately to full scale and will then drop back to zero and remain in this position.

This is caused by the incoming gas mixing with the air present inside the meter chamber. The mixture immediately ignites, causing the resistance to rise and the meter to give an indication.

As this supply of air is diminished by combustion, it is replaced with the heavy gas concentration; oxidation ceases and the filament is cooled. The meter hand then drops back to zero as the resistance returns to balance.

Most commonly encountered gases are registered on the meter quite accurately or within a reasonable error on the side of safety. These include natural and manufactured gas, methane, ethane, propane, butane, carbon monoxide, acetylene, and the vapors of pentane, hexane, heptane, methyl alcohol, ethyl alcohol, benzene, ethyl ether, acetone, ethyl acetate, and the more volatile lacquer thinners and paint thinners.

Hydrogen alone, hydrogen sulfide alone or mixed with other flammable gases, and carbon disulfide may give indications lower in calibration than the actual concentration present in some meters. Special models or calibration charts are available to provide correct interpretation where it is expected that frequent contact with these gases will be made.

The relatively non-volatile solvents such as the higher alcohols and ethers will all register on the more or less unsafe side of the normal calibration, particularly when testing an atmosphere which is hotter than the instrument being used. Partial condensation may occur in the sampling system under these conditions and a true reading will not result. Consequently where vapors of liquids which do not fully vaporize at normal temperatures are present, the sampling line and instrument should be of the same temperature or higher than that of the atmosphere under test.

The sensitivity of the instrument depends on the catalytic action of the platinum wire. Materials such as tetraethyl lead, silicones and some sulfur compounds may contaminate the surface of the wire and interfere with the catalytic action. This may lead to erroneous results when attempting to sample atmospheres containing products which have a high ignition temperature.

To prevent this, the filaments are operated at a high temperature and it is important to maintain the battery strength in order to do so. Inhibitor filters may also be used where tetraethyl lead is frequently encountered. The inhibitor causes a chemical action which produces a more volatile product of lead, thereby permitting more complete combustion and preventing contamination.

The indicating meters should be given good care in order that they may be ready at any moment to do their job. The flashlight-type batteries which power the unit should be fresh and occasionally tested by noting if the meter hand comes up to the battery test mark on those models so equipped.

The indicator may be tested for operation by placing a few drops of gasoline or lighter fluid on a cloth, hold it close to the sampler and aspirate the atmosphere by working the bulb.

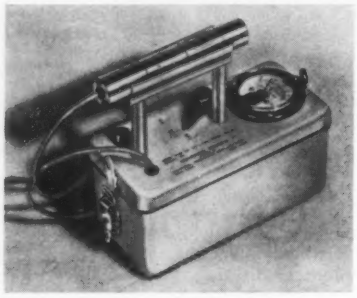
The meter hand should immediately rise up the scale. If it swings quickly to the top of the scale or if a slight explosion is heard in the chamber, no harm will be done. Avoid the use of excessive liquid as it may be drawn into the instrument and be difficult to clear out.

Please turn page

Elmwood Park, Ill., Fire Marshal Henry Sells (left) holds Geiger counter as Civil Defense Director and Fire Lieutenant Ossie Hjellums (center) demonstrate operations. Looking on are Fireman Donald Baier and Engineer Ernest Vulpo (in cab)

Ion chamber with plug-in detection probe for use in measuring remote radioactive sources—*Nuclear Chicago photo*

Geiger counter-type portable case survey meter—*Nucleonic Corp. of America photo*



A compact transistorized Geiger counter used in field surveys
—*Universal Transistor Products Corp. photo*

Pocket dosimeter (right) and charger
—*Tracerlab Inc. photo*

Nuclear radiation hazards

One of the modern unusual hazards which now face firemen in all parts of the country is radioactivity. While its dangers may be exaggerated in the mind of the average citizen, due to the publicity given to war weapons, it nevertheless presents insidious hazards to fire fighters.

Particles given off by the radioactive material cannot be seen nor felt and generate no odor. In case of injury due to their action, effects are seldom noted until some time has passed, which in case of severe exposure, may then be too late for effective treatment.

All radioactive materials presently used in industry, medical research and treatment are licensed by the U. S. Atomic Energy Commission. In the approximately 10 years since the AEC began issuing the permits, almost 5,000 licenses have been granted to use or store the materials.

Cobalt 60, Strontium 90, radium, etc., are popular materials used by the larger hospitals and radiologists. Industrial firms are presently using Strontium 90, Cesium 137 and Cobalt 60 in process control and radiographic inspection.

These materials may be in the form of liquids, solids or powders sealed in stainless steel capsules or glass, all locked in vaults made of steel and lead. In the event of fire it is conceivable that the material can escape from its container, due to melting or eruption, and contaminate the area as a result of spreading through the air (See FIRE ENGINEERING, August 1956).

One of the cardinal rules of atomic safety is to know where these materials are located. Thus forewarned, fire fighters can be prepared for any eventuality and take proper precautions at the outset to prevent fatal exposure. This information is usually available through state health and labor departments, and all fire chiefs should have knowledge of occupancies within their districts where the materials are stored or used.

As with hazardous gases, the regular fire fighting protective clothing and respiratory equipment give a good measure of protection; in case of exposure to dust-laden atmospheres decontamination is facilitated.

The detection of nuclear material depends on special instruments which in most cases also can be used to measure the intensity of radiation. The latter is important in determining not only if it is safe to operate in any fire area, but also for the period a man can safely remain when exposed.

Most of the instruments depend on electronic circuits, but a simple device which can record total exposure utilizes a piece of photographic film. The "film badges," as they are referred to, are primarily used by workers who are constantly employed in areas where the radioactive substances are maintained; they measure the amount of radiation over a given period of time. The film is sensitive to radioactivity and even though unexposed to light, the invisible particles will fog the film in proportion to their strength. The density of the film is compared to a standard at the end of a given time period and it can be determined how much radiation the worker has been exposed to. In this manner the employee may be protected from an accumulative overdosage.

The "Geiger," or more correctly, "Geiger-Mueller" counter, so named for its inventors, is an electronic device for detecting and measuring radiation and is readily portable in most models. As a result, they are popular for field survey work and some fire departments are presently equipped with them.

The common type of counter employs a probe connected by flexible cable to a small case which contains an electronic amplifier, power supply and indicating meter. The probe proper is fitted with a Geiger tube.

The tube consists of an anode and cathode energized by high voltage in an atmosphere filled with gas. When alpha, beta or gamma particles strike the tube wall, the gas molecules are ionized, causing a pulse of current flow between the electrodes, as the anode and cathode are called. The voltage pulses, at a frequency proportional to the magnitude of the radiation field, produced by this minute current flow are then amplified and indicated on a rate meter, as flashes in a neon tube or as clicks in headphones.

A Geiger counter is extremely sensitive and is primarily used to detect radioactivity although measurements can be made with equipment which indicate on the meter dial the pulse counts per minute.

The survey meter or "Ion chamber" is similar in some respects, but uses a low voltage to ionize the chamber which contains the electrodes before its use. Radioactive particles striking the chamber

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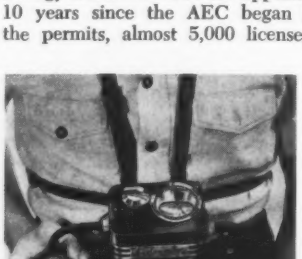
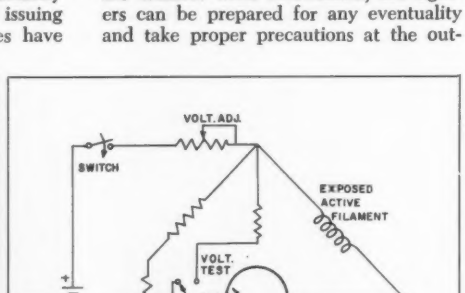


Above: Common type of gas indicator which determines explosibility of atmosphere
—*Mine Safety Appliances Co. photo*



Right: Circuit diagram of gas indicator—*Johnson-Williams, Inc. photo*

Instructor guides Los Angeles County firemen using high pressure booster lines to mop up gasoline spill fire during school session
—L. A. County F. D. photo

The Case for High Pressure Fog

Water fog is now universally accredited as an outstanding extinguishing element. But how about high pressure fog? This study reveals its current status

A STAFF REPORT

HOW MUCH WATER TO USE on a given fire has proved one of those questions which invariably provoke endless discussion among fire fighters. Many professional firemen have been accustomed to thinking in terms of the relative values of 1-inch, 1⅛-inch, 1¼-inch and 1½-inch tips when used on large fires. There is no question but that such knowledge is valuable, but the records indicate that approximately 90 to 95 per cent of all fires are extinguished while small.

Of course there are exceptions, but notwithstanding, the thinking in the fire service—at least until recently—has been in terms of large volume. That good old idea of "give me lots of water and I can handle any fire" is not easily uprooted, even when there is overwhelming evidence to the contrary.

The practical fire fighter uses water as a tool and often his experience is gained by solving problems without the assistance of others who have traveled the same road. The result is that he knows that water in quantity will do a good job and since there is usually no cash outlay for it, why be concerned about volume.

Although there is something to this reasoning, other practical fire fighters have gone far beyond the simple question of pouring water on a fire. Studies have been made of the relation between volume and extinguishing effect and considerable data has found its way into print, much of it under the heading "water fog."

World War II the stimulant

Water damage is today an important item in municipal fire service operations and while urban fire departments have come a long way in using minimum quantities of water to extinguish small fires, much of the credit for pointing the way belongs to the rural and small-town fire agencies which, in adapting water fog to their problems in the early Twenties, demonstrated the effectiveness of small volume.

Of course, it remained for World War II to really bring fog into the limelight as a fire suppression medium. It is said that fog gained more ground in the few years following Pearl Harbor than during the 18 years which preceded the war. Nevertheless certain elements of the application of finely divided water, which we call fog, remain to this day shrouded in mystery and misunderstanding.

Over 14 years ago, one authority[1] wrote, "The really disturbing feature is that a number of organizations have accepted claims . . . without fully investigating the possibilities in other directions. The result is that fog equipment conversation seems to revolve around one point only—namely ultra-high pressure."

The controversy over high pressure fog versus low pressure fog continues although there is today little skepticism raised against water fog in general. This reluctance to accept what appear to be revolutionary thoughts and things has always existed in all fields of endeavor. It is nothing new to the fire service.

Regardless of precedent or personal preferences, the fact remains that since the first practical high pressure fire fighting apparatus was introduced to the

[1]Western Fire Equipment Co., San Francisco, Calif., in "Forester Fire Equipment Notes," Dec. 1947.

From top to bottom:

High pressure fog-foam is employed by fire fighters to extinguish aviation fuel spill fire during drill at Long Beach, Calif., Air Reserve Center—*High Fog Pump Co.*

Rural fire fighters demonstrate use of high pressure streams for grass and brush fires while front-mount pumper is in motion—*American Fire Apparatus Co.*

Incorporation of a piston-type high pressure pump on city service ladder materially multiplies fire fighting effectiveness—*John Bean Div.*

Demonstration of recently introduced four-stage centrifugal high pressure pump incorporated on same chassis with volume pump—*W. S. Darley & Co.*

Orthodox booster installation is replaced in this aerial ladder by four-stage centrifugal high pressure pump and twin high pressure hose reels—*American LaFrance Co.*

American fire service, there has been a steady increase in the number of such apparatus purchased and the records of fire extinguishment show that where used intelligently, high pressures have registered significant successes in the reduction of fire losses, particularly where loss figures include damage by water.

A brief review of some of the advantages of water fog in general, and its application in fire extinguishment, should be helpful in any study of high pressure fog.

Fundamentals of fog

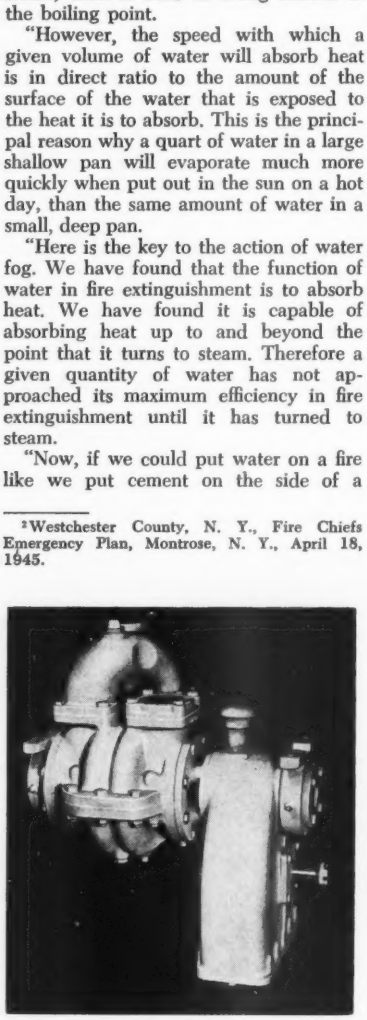
One authority, Hugh N. McNair, speaking before a large fire service group,[2] set forth the general advantages of fog in this manner: "The reason water is such an excellent extinguisher is due to its tremendous ability to absorb heat. It will absorb heat right up to and even after it has turned to steam. As a matter of fact, it absorbs almost six times as much heat at the moment that it is turning into steam, than it does in being heated to the boiling point.

"However, the speed with which a given volume of water will absorb heat is in direct ratio to the amount of the surface of the water that is exposed to the heat it is to absorb. This is the principal reason why a quart of water in a large shallow pan will evaporate much more quickly when put out in the sun on a hot day, than the same amount of water in a small, deep pan.

"Here is the key to the action of water fog. We have found that the function of water in fire extinguishment is to absorb heat. We have found it is capable of absorbing heat up to and beyond the point that it turns to steam. Therefore a given quantity of water has not approached its maximum efficiency in fire extinguishment until it has turned to steam.

"Now, if we could put water on a fire like we put cement on the side of a

[2] Westchester County, N. Y., Fire Chiefs Emergency Plan, Montrose, N. Y., April 18, 1945.



Latest addition in the high pressure pump field is this two-stage centrifugal. Rated at 40 gpm at 1,000 psi or 100 gpm at 400 psi —*Hale Fire Pump Co.*

The Philadelphia Fire Department was one of the first large departments to employ high pressure fog. Note pattern and reach of these streams—*Philadelphia F. D. photo*

house and leave it there until it has absorbed all the heat it can, that would be ideal. Unfortunately, it will not stay put. Poured on in large volumes, it seeks its own level and flows rapidly down to the basement or out to the street, doing plenty of damage on the way. The short time it has been exposed to the heat of the fire has not allowed it to absorb more than a fraction of the heat it is capable of absorbing.

"Any method, therefore, of applying water so that it will absorb a larger quantity of heat during the time it is in contact with the fire and the burning material, will increase its efficiency just that much. This is exactly what water fog does.

"By breaking the water up into very small drops, it exposes a very much larger surface area of the water to the heat of the fire. Each of these little drops absorbs heat and turns to steam much more rapidly than it could if it were part of a solid body of water, and the cooling action is distributed over a wider area. It is the application of the same law that makes the water in the shallow pan evaporate more quickly than the water in the deep pan, and it is the practical utilization of the factor of water distribution.

"We find, therefore, a perfectly logical explanation as to the reason the water fog extinguishes fire so effectively with a relatively small amount of water and with very little water damage. Less water is needed to begin with to obtain the same amount of cooling, a larger area is cooled at one time, and, finally, a much greater percentage of the water turns to steam and is dissipated in the air."

Mr. McNair pointed out that all of these factors are of greatest importance in areas where water has to be transported to the fire such as in rural and forest fire control operations.

Although the value of finely broken fire streams in extinguishing fire was recognized long before World War II, that conflict saw the first serious studies of what we term "water fog" and its application to various types of fires.

This research was stimulated by the armed forces which faced the extensive use of gasoline and petroleum products on land and at sea. A major problem was the control and extinguishment of high octane gasoline resulting from plane crashes where large combinations of burning fuels spread thin over large areas as well as in the crashed plane were involved. This problem was intensified by the fact that in a majority of cases the water and/or other extinguishing agents had to be brought to the scene of the crash.

H.P. fog is established

The history of that research and the experiments need not be repeated here. Suffice to say that among the expedients tried out was the high pressure tree sprayer in use for many years by large orchards. At that time one firm, the John Bean Division of the Food Machinery Corporation of Lansing, Mich., had been producing ultra-high pressure fog apparatus based upon the principle of the tree sprayer for fire fighting. Product development, however, was slowed when the war came along, resulting in the ban on the sale of fire trucks for municipal use without exceptional priorities.

Following the cessation of hostilities, the company, together with others which had been engaged in research into high pressure fire streams, embarked on production of complete high pressure fire fighting apparatus for municipal use. This ultimately resulted in mobile pumpers designed and built to take fullest possible advantage of high pressures to develop the kind of water fog desired for aircrash and other related emergencies.

As the years passed, the fire service had ample opportunity to study high pressure fog and the equipment and apparatus which produced it. From these case histories, certain basic conclusions were possible, although they have not been universally accepted by fire fighters, some of whom still view water fog with suspicion. We will review these conclusions later on. The fact which should be stressed at this point is that (1) high pressure presently is widely used in the fire service; (2) its advent has resulted in some marked changes in the design and construction of certain types of fire apparatus; (3) its introduction into the field of fire control and extinguishment has (at least where it is employed) resulted in marked revisions in fire attack and defense techniques; and (4) its acceptance by large municipal fire forces, some of which have entered repeat orders to the manufacturers attesting to its satisfactory application in large urban as well as suburban and rural areas.

Refinements and improvements are also finding their way into the high pressure field of apparatus. These refinements include the size of the booster tank; length of high pressure hose and the reels which carry it; introduction of proportioning equipment and carrying space for additives and other improvements.

A recent introduction is a nozzle adaptor which permits the effective use of foam with the small lines. Another is

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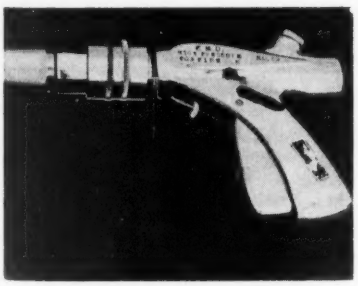
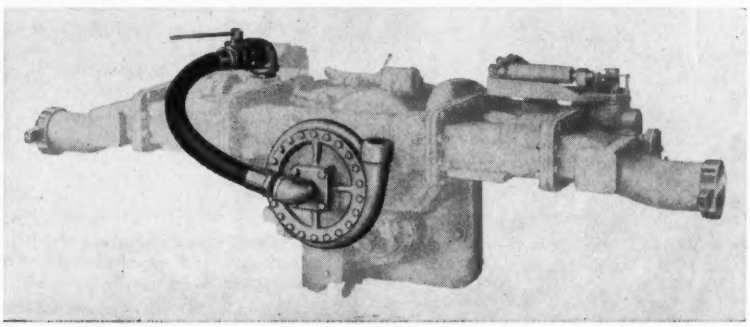


Nozzle pressure regulator permits firemen to select desired pressure of certain gun-type nozzles by merely rotating control on barrel ahead of pistol grip—*Halprin Supply Co.*



In this assembly, high pressure is provided by adding a third stage to a standard centrifugal volume pump. Operation is controlled by a single valve—*Waterous Co.*

Student fire fighters employ high velocity fog to control fire in 17-foot oil pit. Stand-by crew holds back-up line in readiness
—All photos courtesy Consolidated Edison Co.

Special Hazards Call for Special Training in Firemanship

How Con Edison Trains Its Personnel —With Assists to "Visiting Firemen"

By W. E. ROSSNAGEL*

THE MODERN PUBLIC UTILITY CORPORATION supplying many customers in many locations with electricity, gas and steam, as does the Consolidated Edison Company of New York, presents special and sometimes peculiar problems in fire control and extinguishment.

To cope with these problems, the company has established definite safety and security services. At the same time it has assumed the responsibility of not only training these special services in the fundamentals of fire suppression, but its broad-gauged training program undertakes to educate and train its operating personnel as well.

This report deals with Con Edison's fire brigade organization, its comprehensive industrial fire school, the training curriculum, with highlights of the major subjects taught. It is hoped that much of the subject matter, condensed as it is, will prove interesting and instructive to readers of FIRE ENGINEERING.

* William E. Rossnagel holds the position of safety engineer of Con Edison, New York. He is widely known as author of technical articles on fire suppression, many of which have appeared in FIRE ENGINEERING.

Industrial brigade important

Every plant, regardless of its size or location, needs personnel well-trained in fire safety. Most large industrial companies, especially those in small communities and perhaps distant from municipal fire protection, have their own employee fire brigades for protection of their property.

Organized municipal fire departments, even in large cities, depend to no small degree upon these industrial fire brigades in their area to hold fires in company installations under control until their arrival. The more completely these plant firemen can accomplish this, the happier the municipal fire fighters.

The brigade members also render invaluable assistance to fire fighters for they are familiar with the location of all important fire line valves and process valves, the operation of the fire pump, location of electrical controls, location and nature of hazardous chemicals, etc.

Although it is a generally accepted fact that the municipal fire chief is in charge of all fire fighting operations when he is summoned, the wise chief makes it a practice to consult with, and to a considerable degree be guided by, the advice of the plant brigade officers. The wisdom of close cooperation between municipal and plant fire fighters is too well known to require embellishment here. What is important is the advisability of cooperative effort in training "all hands" for possible fire incidents relating to the plant, its production and distribution systems, etc., with emphasis on particular hazards peculiar to the plant.

Actually, there is not too much difference in the training of the professional fire fighter and the brigade member. The fireman has to have the know-how to fight all types of fires in all kinds of buildings, whereas the plant fire brigade members are trained primarily to handle fires of the types which may occur in their own installations. It is expected of them that they will be more familiar with the behavior of the chemicals or other hazardous materials in their own occupancies than will outside fire fighters.

Fire brigade organization

Depending upon the type and size of the plant, the industrial fire brigade may

consist of one or more companies under the direction of a chief, and possibly captains and lieutenants. Although not always provided, the brigade protection should function on all three work shifts. It is important too that there be protection on week ends and holidays.

Such an organization is not always possible, however, and other means of fire protection must be provided. This may involve the use of other plant personnel in auxiliary capacities. In office buildings, garages and small storehouses where the operating personnel is limited in number, it is found advisable to give all or most of the men training in at least basic extinguishing methods without having a formal organization. But in large electric generating stations a different problem is presented.

A modern power plant of about 350,000 kw (nearly ½-million hp) can be operated by 10 men on each watch or shift. But several of these men are switchboard and boiler operators and cannot under any condition leave their fixed posts to fight a fire. Hence, the number of men on the fire brigade is definitely limited. In the older stations, where there are many more men employed, another problem is presented. These men all work on rotating watches, having their days off and their swing shifts respectively on all seven days of the week.

This makes it impossible to name men as officers and members of the fire brigade, for on a certain watch of a certain day there may be no officers but many men, while on the next watch there may be a surplus of officers but insufficient men. To overcome this, it is customary in some companies to have the fire brigade made up of job assignments rather than of personalities. For instance, the brigades on all watches may be made up of the general watch foreman (as chief), a mechanic, a janitor, a boiler cleaner, an oiler, a coal handler and an electrical gallery man. Then whoever is on duty in any of these job assignments at the time of a fire is automatically on the fire brigade.

Industrial fire school

Many corporations with industrial fire brigades conduct training programs for these potential fire fighters. One such company is the Consolidated Edison Company of New York (better known to TV viewers as "Con Edison," a public utility company serving the metropolitan area with electricity, gas and steam), whose fire school has been conducted four months each year for the past 10 years.

During that period most of the operating employees have attended classes a number of times. Also trained at this well-equipped fire school were 1,600 officers and men of the U. S. Coast Guard Reserve, officers and firemen from New York City and other paid fire departments, volunteers from suburban fire departments and fire protection engineers and fire brigade members from various industries in the area. The New York Fire Department has also been granted the use of the drill field facilities for experimental and training purposes.

The classes at the school are usually limited to 30 or 35 men, every one of whom takes an active part in a wide variety of fires. Briefly, the program includes the following, many of the fires being repeated a number of times to give all men a chance to take part in them. The various facilities for conducting actual training-by-doing are all regular fixtures in the Con Edison school.

1. Lecture on the various classes of fires, types of extinguishers, hose, nozzles, etc., with a brief talk on the theory of fire

2. Fire in large pile of scrap wood, using soda-acid, water and anti-freeze extinguishers. The ineffectiveness of CO_2 is demonstrated

3. Fire in a small tub of fuel oil, using foam, dry chemical, CO_2 and vaporizing liquid

4. Fire in engine compartment of motor truck, using CO_2, vaporizing liquid and dry chemical

5. Fire in paint locker with flammable liquid spilling from shelves, using CO_2, dry chemical, loaded stream, water fog

6. Fire in 64-square-foot pan of fuel oil. Dry chemical, water fog, single powder chemical foam and mechanical foam are used

7. Burning gasoline flows from leaking pail onto long sloping surface to produce a flowing fire. CO_2 and dry chemical are used

8. Fire in large electric motor. Vaporizing liquid and CO_2 used

9. Fire in large transformer. CO_2, dry chemical fixed water spray system used

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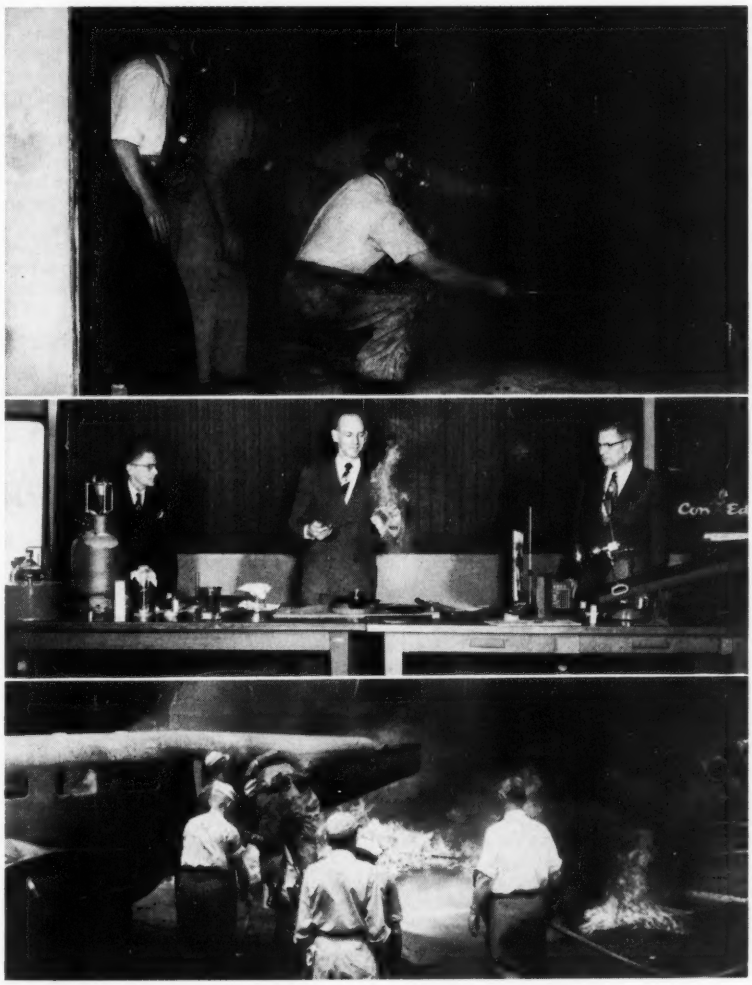
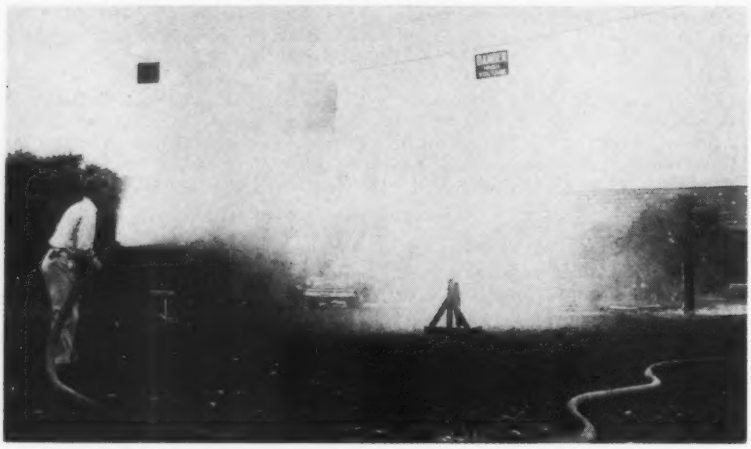


Upper: Vaporizing liquid extinguishers are used on electrical equipment during school session. Note students and instructor wear masks

Center: Demonstration lecture on theory of fire is high spot of school. Author William Rossnagel is at right; other instructors are unidentified

Lower: Con Edison fire school is equipped for training in many phases of fire fighting. Scene shows students making rescue from mock-up plane



Confidence in use of water fog on electrical equipment is taught to all employees attending fire school. Here student directs fog pattern on to 27,000-volt conductor

10. Fire in below-the-street transformer vault. CO_2, dry chemical and water fog are used

11. Indoor oil fire in simulated electric substation. CO_2, vaporizing liquid (using gas masks), dry chemical, mobile water spray units are used

12. Fire in propane escaping from defective flange in 4-inch pipe. CO_2, dry chemical, fog nozzle, hose stream used

13. Rescue of dummy from "crashed" and burning 12-passenger airplane, using water stream to wash gasoline away to clear a path for a rescuer who is protected by a man with a fog nozzle

14. Operation of two-powder foam system as installed on large oil tanks

15. Operation of sprinkler system with alarm check valve

16. Indoor explosion of cloud of coal dust

17. Small hydrogen explosion

18. Extinguishment of fire in 3,000-gallon tank of oil by injecting air into bottom of tank

19. Use of mobile water spray unit on live electric truck switch

20. Use of 2½-inch fog nozzle, held in bare hands by men standing on wet ground, and directed against a steel grating suspended above the ground 6 feet away and energized at 27,000 volts. Salt (sea) water is used and every man takes his turn holding the nozzle

The manufacturers of various types of extinguishers render valuable assistance in the fire fighting programs. At the Con Edison fire school, each make and type of extinguisher is operated in the most effective manner, for all types are installed in company plants and all may be called upon in event of a fire.

Once or twice each year a demonstration lecture is presented to the supervisors and fire brigade members on the theory of fire, using miniature fires and explosions to demonstrate such properties of flammable liquids as flash point, ignition temperature, explosive limits, vapor density and vapor pressure. Men having possession of this knowledge may be in a position to observe a potentially hazardous condition and thus prevent an accidental fire or explosion.

All untried makes of extinguishers, nozzles, hose, etc., are tested under fire conditions at the fire school drill field before being placed on the approved list for purchase.

Much experimental work is conducted at this school for the purpose of developing new extinguishing agents, means of applying and the techniques. Tests are conducted on heat-retarding paints and other materials.

Not every industrial plant brigade is equipped with training facilities like Con Edison which can serve also for experiment and research into all phases of fire extinguishment. This is a very real asset.

Extinguishers

The school teaches that there is no single type of extinguisher which is effective on all three classes of fires (Classes A, B and C), found in industrial occupancies, although a water-type or loaded stream-type extinguisher equipped with a miniature fog nozzle should approach this ideal.

Solid materials, when burning, store up a large amount of heat, and to quickly absorb this heat, nothing is better than water or other liquid which can be readily evaporated. CO_2 and dry chemical absorb relatively little heat, but they produce a blanket of inert gas or an atmosphere which excludes oxygen and thereby smothers fires in flammable liquids. Where solid materials are loosely packed, such as waste paper, excelsior, draperies, etc., relatively little heat is stored up, and in such fires CO_2 or dry chemical may be used if other extinguishers are not available.

Some of the operating techniques for the use of extinguishers taught at the school are given in the following paragraphs. There may be some differences of employment in a given industry, but these methods have proven effective for Con Edison.

Liquid type extinguishers used on fire in solid material: Walk completely around the fire and direct the stream into the innermost areas where there is fire or embers. Aim the stream at the burning material (so as to cool it), not at the flame. Don't waste the liquid, it is precious. Holding your thumb in front of the nozzle will produce a spray, bringing greater amount of the liquid into contact with the burning material, so that it will be evaporated and absorb heat.

Any fire in solid materials: While extinguishing the fire, kick or knock the burning material apart, and separate it if possible. Remember that solid materials separated from other burning pieces will not continue to burn. You cannot maintain a camp fire if you separate the logs.

Almost any fire in solids or liquids: If there are two or more fires in progress at the same time, tackle the smallest ones first and get them off your mind, then go after the big one; otherwise you will soon have several big fires to fight.

Foam or vaporizing liquid on a fire in open pan or tank: Don't direct the stream into the burning liquid, for it will go to the bottom. Instead, aim the stream at the inside of the far wall of the container, just above the liquid, and let the extinguishing agent splash back or run down the wall onto the burning surface. Walk around the container so as to completely extinguish the fire.

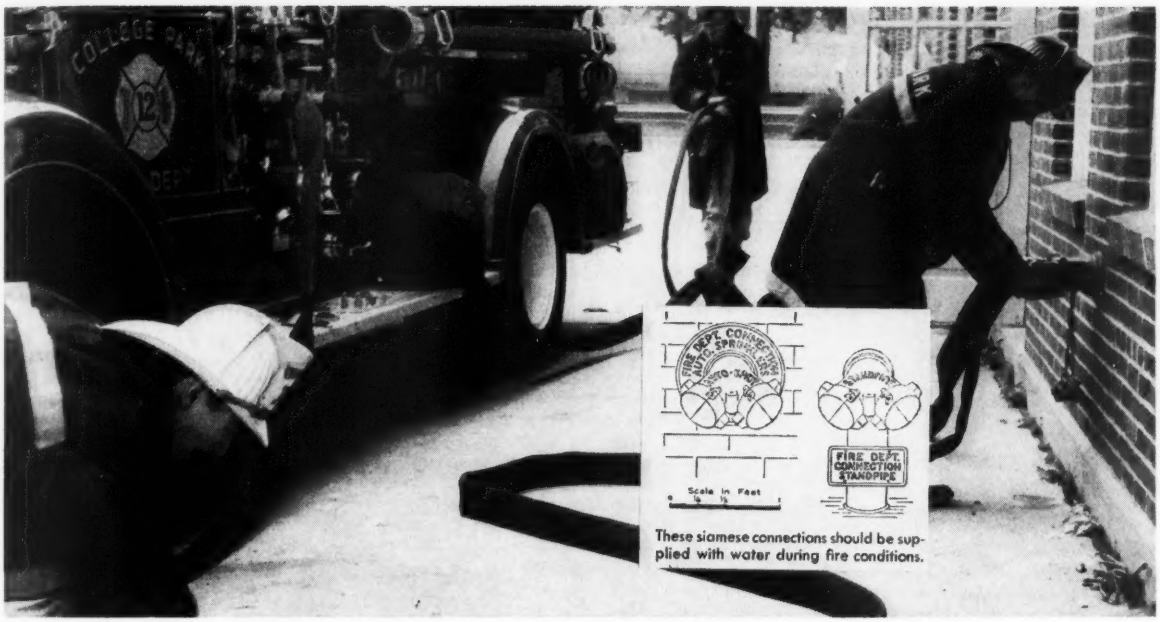
Foam extinguisher used on oil spill fire on ground: Don't direct the stream into the liquid, for this will splatter the burning liquid, and may start other fires. Stand back 20 or 30 feet and aim the stream high in the air and allow the foam to drop like snowflakes onto the burning oil.

Dry chemical used on large oil fire: Get organized. Have several men ready with their dry chemical extinguishers "cocked" and ready to "shoot." At a given command all men tackle the fire at the same time. Two or three extinguishers used simultaneously will be much more effective than a half-dozen used one at a time. In other words, "gang-up" on the fire.

When tackling a large fire, alone or in a group, aim the discharge of powder for the first second at the flames (this produces a heat curtain or shield in front of you to protect you from the heat of the flames), then direct it across the surface of the burning oil, sweeping slowly from side to side.

CO_2 or dry chemical on fire in solid material: If the proper extinguisher is

Continued on page 781



These siamese connections should be supplied with water during fire conditions.

Hooking up to fire department siamese during drill at University of Maryland training school. Inset indicates two types of connections—standpipe and sprinkler—which may be encountered—*National Automatic Sprinkler and Fire Control Assn. photos*

Modern Fixed Fire Control Systems

Designed to help hold losses to a minimum, standpipes and sprinklers are the friends of fire fighters

By DONALD M. O'BRIEN

THE ACTIONS TAKEN in the first few minutes following inception of a fire generally determine its extent and severity—and the loss ratio. The importance of these first few moments and the ensuing action have been repeatedly stressed by fire protection engineers. It also has spurred efforts to insure prompt detection and notification of fire and to install protective facilities which persons on the scene may take to contain the fire before the arrival of fire forces.

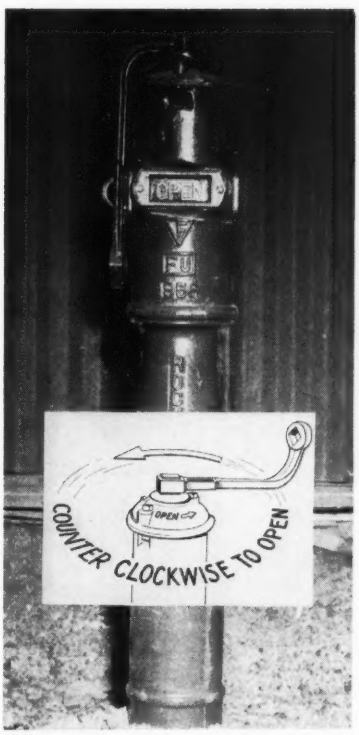
Regardless of how involved these details become, it is usual that first aid fire extinguishers and fixed auxiliary fire fighting systems are employed to protect an occupancy. The latter may consist of standpipe and hose systems, sprinkler systems, combinations of both, or special adaptations of the sprinkler which depend on foam, carbon dioxide, dry chemicals, etc., for extinguishing action. Most of the automatic systems, in addition, provide means for sounding an alarm and in special cases may be designed to effect actual extinguishment.

The common standpipe riser and hose rack, or reel, located on each floor provide a ready means for applying water on fires in buildings. They are also useful to fire departments as a means of supplying hose streams on the upper floors of tall buildings without having to lay long lines of hose.

Generally they are equipped to supply a limited number of either 2½-inch or 1½-inch hose streams, although systems designed for only 1½-inch hose are sometimes found. When fire fighters employ the former for inside lines it is common practice to remove the normal 1½-inch hose, usually connected by means of a reducer, and then substitute regular fire hose.

The 2½-inch systems consist of risers of not less than 4-inch pipe for buildings not greater than six stories or 75 feet in height and 6-inch risers for buildings above that height. In extremely tall buildings reservoir tanks and auxiliary pumps may be included at various levels.

Water supply may be from tanks



Post indicator valves normally open counter clockwise. Some exceptions may be found in older installations

Latest type upright sprinkler head uses solid chemical for fusible element
—Globe Automatic Sprinkler Co. photo

mounted above the building roof or through a fire pump located in the basement and drawing its supply from an emergency reservoir or direct from street mains.

Fire department connections of the siamese-type permit fire pumpers to boost the pressure as required. In some installations the standpipes may depend entirely on supply from the fire department connection.

Sprinkler systems

A complete modern sprinkler system consists of a series of vertical pipes or risers which conduct water to the various floors of a building. Extending out from the riser connection at each floor is a lateral or pipe of smaller diameter which distributes the water to the branches. The latter are pipes of still smaller diameter on which are mounted the actual sprinkler head, the operating sentinel of the system.

Sprinkler heads are called "solder" or "non-solder" types depending on their action under fire conditions. The solder type consists of a fusible strut which holds a stopper in the sprinkler head orifice. Whenever heat in the immediate vicinity exceeds the design temperature of the solder, the strut melts. Water pressure then forces the stopper out of the orifice and extinguishing action begins.

The non-solder type generally consists of a frangible bulb containing a heat-sensitive chemical and serving the same purpose as the solder strut. When the chemical is heated it expands until at a design point it fractures the bulb, releasing the stopper and permitting water to flow.

The standard sprinkler head is mounted on the top surface of the branch and discharges water upward to the ceiling where it is deflected downward toward the floor.

A more recent introduction is the pendent type which discharges directly below the branch, which may be hidden from view above the ceiling proper. Where desired, modern sprinklers can be made to discharge a fine water spray and are termed "fog heads." This type is designed to provide maximum cooling effect for quenching hot fires; it is considered very good for high hazard areas.

Although, all water spray sprinkler systems are designed for Class A fires, there may be instances where it is advisable to use water on Class B or C fires. Some systems deliver fine water spray on high voltage outdoor electrical transformers where any attempt at hose stream application would be risky to personnel.

Supplying sprinkler systems with water in sufficient quantity is the subject of many engineering and insurance regulations. It is as important as the proper design of the piping which carries the extinguishing agent to the last sprinkler head.

Good practice requires that the supply must be from sufficiently large mains and fed from two directions. Where adequate community water supply is not available, elevated tanks are provided and designed to supply by gravity a sufficient quantity of water for a given period of time. Where water supply is a problem in light hazard areas, a pressure tank system is frequently employed.

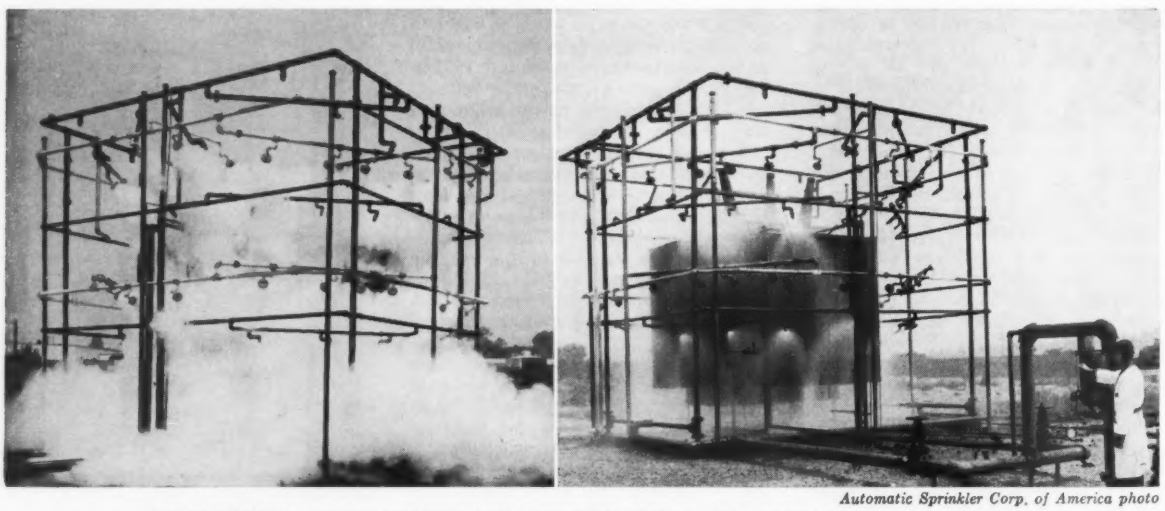
Fire pumps

Sprinkler and standpipe systems are frequently supplied by fire pumps of the rotary, piston or centrifugal type; the latter is rapidly replacing the other types due to its operating characteristics and simplicity. Water power, steam, electricity and gasoline or diesel engines are employed to drive the pumps depending on which method is the most economical and efficient for the conditions of the installation.

Sprinkler systems are equipped with fire department siamese connections so located on the exterior of the buildings that fire departments may connect to them and pump water to maintain desired working pressure in the event a large number of sprinkler heads open.

Fire department pump operators sometimes wonder what is a simple but effective method of supplying a sprinkler system during a fire. The procedures recommended by the National Board of Fire Underwriters in Bulletin 21 are easy to follow and call for no calculations. A pump pressure of 150 to 175 psi is maintained; if the engine labors or it is impossible to maintain the pressure, it is an indication that the volume required is greater than a single pumper can supply and a second engine should therefore be connected.

All sprinkler systems contain a main control valve which may be a post indicator valve, visibly marked to indicate an open or shut condition, and located on the grounds outside the building, or an "O S & Y" valve located in the piping which feeds water to the system. The term refers to "outside screw and yoke" which is descriptive of its construction and placement.



Automatic Sprinkler Corp. of America photo

Test installation for outdoor transformer fixed fire protection systems: (Left) carbon dioxide; (right) water fog

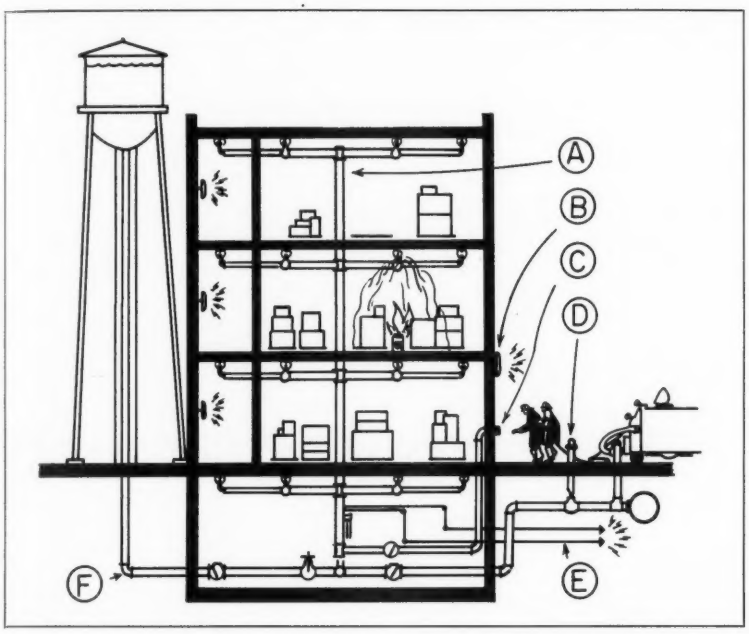


Diagram of building sprinkler system—(A) riser; (B) building water-motor alarm bell; (C) fire department connection; (D) post indicator valve in yard water supply system; (E) fire department or central signal station alarm circuit; (F) elevated water supply

Foam blanket made by water-foam protection system during test at giant Robins Air Force Base, Ga., hangar—*Grinnell Co., Inc. photo*

This valve is normally sealed or locked in an open position and may be visibly checked by noting the screw which protrudes through the yoke beyond the control wheel. If the screw is not visible, it is an instant indication that the system is shut off; a warning that it will fail to operate in case of fire. The fire department siamese previously referred to is usually connected to a sprinkler system in such a manner that water may be pumped in to supply the heads regardless of the condition of this valve.

Dry pipe systems

The normal wet pipe sprinkler system is widely used but cannot be placed in unheated buildings as the pipes would burst in case of freezing.

To overcome this problem a dry pipe system is installed. In general construction it is identical to the wet system but differs in that it contains no water under normal conditions. A special valve in a frost-proof location is tripped whenever a head is actuated, permitting water to flow into the system and discharge onto the fire.

The entire system ahead of the special valve contains air supplied automatically by a compressor at a sufficient pressure to prevent the valve from opening. When a head is actuated, air rushes out the orifice upsetting the balance within the system, permitting the valve to trip. Water is immediately admitted to the piping and eventually discharged from the open head.

In cold weather an actuated dry pipe system must be drained immediately after a fire and the valve reset before it can be returned to service. In warm weather, haste is unnecessary as it will operate as a wet system without further changes.

Deluge systems

A deluge sprinkler system is similar in some details to a dry pipe system in that it does not contain water until needed for extinguishing purposes. However, it does not contain air under pressure and is fitted with open sprinkler heads. The system may be controlled either by a manual valve or by heat detectors.

Once actuated, a deluge valve is tripped which permits water to flow into the piping and be discharged from all heads at one time. It is particularly useful where it is necessary to wet down a large area in a very short time. When used with heat detectors, the deluge system is practical for high hazard areas subject to flash fires, explosions, etc. Installations are frequently found in aircraft hangars and similar buildings where ceilings are unusually high.

Preaction systems are similar to both deluge and dry pipe types and use the same deluge valve and heat-actuating devices; however standard sprinkler heads are attached to the branches.

The preaction system is designed for areas where water damage may be extremely costly but fire will be disastrous. It approximates the dry pipe system without a delay in water flow.

The deluge valve is tripped and an alarm sounds when a heat detector senses a dangerous temperature. Water flows into the system but is not discharged unless the heat buildup is sufficient to fuse or fracture the head.

This gives the personnel in the vicinity time to attempt control of the fire with first-aid extinguishers before any great damage is done, yet provides the ready protection of a wet pipe system in case the immediate fire fighting efforts are unsuccessful.

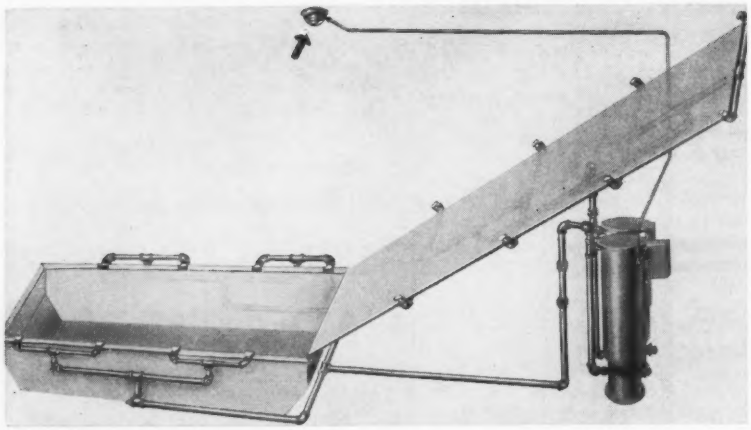
Water curtains are used on the outside walls of buildings and consists of open sprinklers which discharge in such a manner that the water forms a curtain and protects the property against exposure fires. Window openings are also protected in a similar manner by individual heads at each location. They may be automatically controlled, but it is general practice to fit such systems with manual control.

Foam smothering

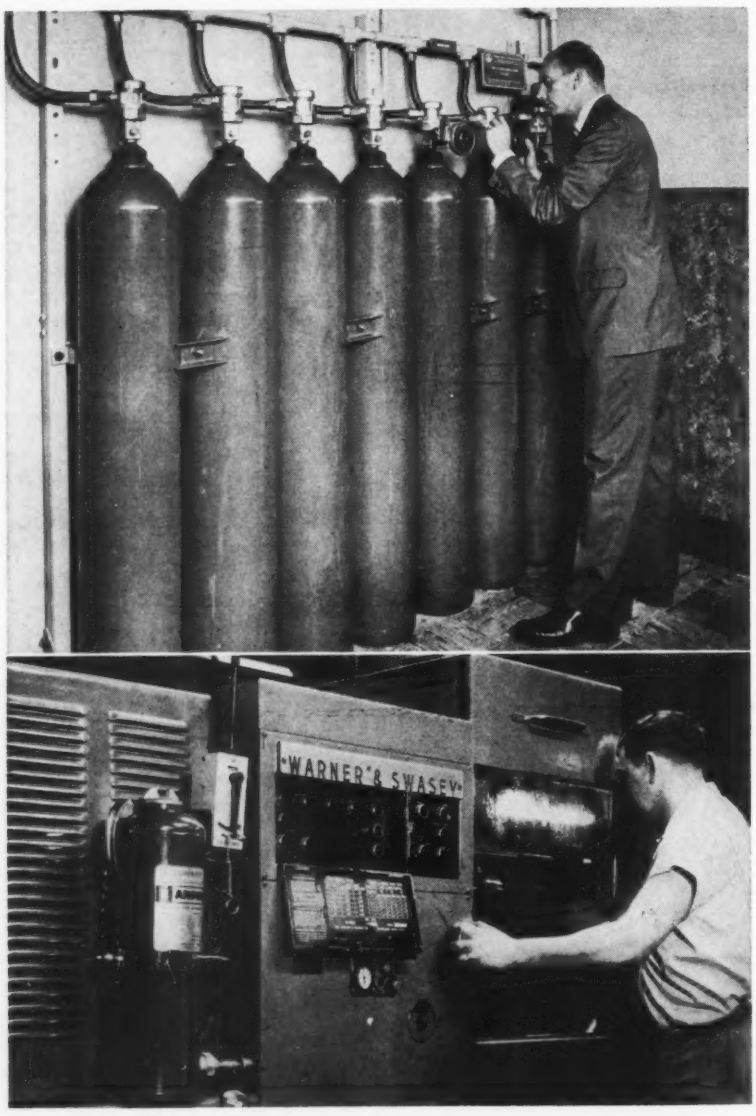
Foam systems have the advantage of reduced water requirements and eventual drainage requirements. Their special feature is that when used on flammable liquids the extinguishing agent prevents flash-back and reignition.

Foam is commonly used in industry to protect oil refineries, paint and varnish plants, and similar flammable liquid producing or using factories. It may also be found in aircraft hangars, pump houses, boiler and engine rooms.

The design of the system may be such



Foam installation for protecting industrial dip tank and drainboard. Heat actuator (arrow) located above tank—*American LaFrance Corp. photo*



Upper: High pressure carbon dioxide battery installation for protecting vaults is actuated by rate-of-rise detector or manual control—*Walter Kidde & Co., Inc.* **Lower:** Fixed dry chemical system designed to protect automatic lathe is actuated by fusible link—*Ansul Chemical Co. photo*

that the agent will be floated over the surfaces of tanks or by means of special nozzles or sprinkler heads, the liquid will be sprayed over machinery.

Carbon dioxide

Carbon dioxide systems operate on the principle of diluting the oxygen content of the air to a point where it will no longer support combustion; they require no water supply.

This type is referred to as high or low pressure, depending on the method of gas storage. High pressure systems employ steel cylinders at atmospheric temperatures and are considered best for installations requiring up to about 1,000 pounds of the agent. A normally empty piping system, leading from a battery of 50 or 75-pound cylinders, conducts the gas to the area under protection.

Low pressure systems store the gas in an insulated pressure vessel at a temperature of about zero degrees F. The low temperature makes it practical to store quantities of 500 pounds to over 100 tons inasmuch as the CO_2 pressure at this point is approximately 300 psi. Safety valves of several types are installed on the tank to vent excess gas to the atmosphere in event of mechanical refrigeration failure.

Carbon dioxide is effective on a wide variety of flammable liquid, electrical and other fires, such as those involving high-value Class A storage where the use of water is undesirable; this is because CO_2 is an inert gas and non-damaging to materials. It is also widely used for motor installations and aircraft.

Carbon dioxide is more effective if applied promptly before the fire has heated the surrounding objects sufficiently to permit reignition. Generally, heat-actuated detectors control the equipment to permit fast release of the gas. It is applied by totally flooding an enclosure or room by local application on the surface protected.

Dry chemical

Dry chemical systems are becoming more popular, being especially adaptable for hot flammable liquid fires. They are also effective on hazards which involve oily deposits. Because such systems require no water storage, drainage problems are simplified. The extinguishing power of this agent at times borders on the spectacular. Installations are similar to high pressure carbon dioxide.

Value to fire fighters

Auxiliary fire control systems have been called "the firemen's best friend." They are constantly on the job, supervising the occupancy and ready to sound an alarm and apply the proper extinguishing agent whenever fire breaks out.

Alert fire officers should make note of all such installations for future reference. If extinguishing agents other than water are employed, this fact should be taken as a signal that some unusual condition exists and the reason for its use should be obtained. It is possible that this information may be useful later. □□

Looking west at gutted Stage 8, Samuel Goldwyn Studios in West Hollywood. Note prop storage at west of stage and proximity of mill at north and two additional stages at east end—all undamaged. Ziv TV Studios are across street to west (top) of photo
—Aerial photo from helicopter by L. A. County F. D.

Joint L. A. County-City Forces Control $2 Million Goldwyn Studios Blaze

By CLIFF DEKTAR

QUICK AND DECISIVE ACTION by combined units of Los Angeles County and City Fire Departments prevented massive loss at Samuel Goldwyn Studios in West Hollywood July 2.

Stage 8, said to be the world's second largest sound stage, was completely destroyed in the early morning blaze.

Andy Buuk, a studio guard, discovered the fire shortly after 4 a.m. and pulled an ADT box, transmitting the alarm to ADT and directly to nearby County Station 8. The station received the alarm at 4:11 a.m. At approximately the same time, a newsboy rang the front door alarm bell, reporting the same fire.

Engines 8, 208, Ladder 8 and Rescue 8 of the L.A. County Fire Department responded directly to the studio—a prime target hazard less than a mile away—and Captain Nino Polito of Engine 8 immediately radioed for a third alarm.

Engine 8 laid a 2½-inch line in and another 2½-inch out, while Engine 208 stretched a 3½-inch. One 2½-inch went to a hand line and the other to the monitor off Engine 208. The 3½-inch line was split, one line being readied for use on the Ladder 8 ladder pipe.

At 4:13 a.m., L.A. City was notified of a fire at Goldwyn. A small portion of the southern half of the studio is in the city and a full first-alarm assignment of three engines, two ladders and a fully manned salvage company responded.

City first-in Engine 41 located approximately three-quarters of a mile from the fire, arrived just ahead of the County's second-in Engine 7, taking a hydrant and laying straight in. Engine 7 under Captain Bill Insley, did the same.

Captain Polito reported that the 400 x 200 x 70-foot stage was completely involved. Immediate attention was given to protecting all exposures, which included the studio mill, power houses, two stages and prop storage next to the involved stage.

In addition, other exposures included numerous sound stages of Ziv TV across a street to the west.

Firemen made no attempt to enter the burning studio because of the danger of the walls collapsing, but heavy appliances, including deluge sets, monitors, and the ladder pipe on County Ladder 8 were brought into play.

County Battalion 1 commander, Sam Tanksley, reported that a good water supply aided the fight. Sixteen lines were laid in to the fire with batteries on City Engines 82 and 27 brought into play, plus the monitor of County Engine 208 and the ladder pipe. The latter was later shut down.

Studio Fire Chief M. N. Ouellet reported the stops made by the fire crews were excellent, pointing out that the prop storage adjacent to the west side of the stage was saved.

Ladder company personnel laddered the two stages on the east and the Ziv stages to the west.

By 8 a.m., Assistant Chief C. A. Tingley was withdrawing city crews, leaving county units under Assistant Chief William Weyant to overhaul throughout the day.

Complete response included County Engines 8, 208, 7, 14, 209, 32, 38; Ladder 8 and Rescue 8. L. A. City response included Engines 41, 51, 52, 27, 61, 82; Ladders 27, 29, 61 and Salvage 27.

A complication developed in the fact that several regularly scheduled county move-up companies were out of service, operating on a foundry fire in the same battalion. However, other units filling in for them moved up to cover. The County also fought a three-alarm fire in a series of buildings in the Artesia area necessitating some juggling of move-up units.

Damage was estimated at more than $2,000,000. Completely destroyed were sets and props for "Porgy and Bess" which was ready to shoot. □□

Left: Few occupations call for as many types and kinds of protective garments as that of the fire fighter, as the subject of this picture, Fireman Tom Barrett of the Detroit Fire Department, will testify. **Center:** Whether it is plaster dust or poisonous smoke, it can be downright discomforting—and dangerous—to the fire fighter—*Bridgeport F. D. photo.* **Right:** The dressed-for-duty fire fighter. From leather helmet to coat and boots, he's ready for what may eventuate—*B. F. Goodrich photo*

Fashions in Fire Fighters' Apparel

What the fireman wears in fighting fires may make all the difference between safety and misery to himself

By SIDNEY WOHLFELD*

THE USE OF PROPER PROTECTIVE CLOTHING[1] can prevent many painful injuries which firemen philosophically accept as part of their job. We all realize that fire fighting requires many dangerous operations, which must be performed quickly under unusual and trying conditions. However, we can perform these tasks with greater efficiency by preventing unnecessary injuries. Preventing unnecessary injury to self calls for a combination of personal caution, and the necessary body protective apparel—using the term in its broadest sense.

Private industry has found that wearing proper clothing during hazardous operations pays off in greater efficiency, reduced workmen's compensation rates and medical expenses, less time lost by injured employees and less time wasted breaking in replacements for injured employees. Fire departments should follow industry's example by drawing up a safety code to cover all types of operations, and insist on compliance by making this code part of the book of regulations—and by making readily available the requisite safety facilities.

This safety code should specify the types of protective clothing to be worn at various times, depending on climatic conditions as well as the type of work being performed. The municipality should supply the necessary clothing, or provide a clothing allowance for each member to include the cost of purchase, cleaning, replacement and repairs.

A study should be made to get the proper type of clothing that will stand up under use, wash easily and dry quickly. Consideration should be given to new synthetics which retain a pressing and permit members to look neat in quarters and while performing fire prevention, hydrant inspection and other duties where they are observed by the public.

As an example, the purchase of a washing machine has paid dividends in cleanliness, neatness and convenience for company members.

During cold weather some departments make it a practice to keep a reserve change of clothing in a waterproof compartment on the apparatus, to permit changing to dry clothing when the fire is under control. If sufficient dry clothing cannot be kept on the vehicles, then special rigs can be used to carry or pick up garments. Sometimes, apparatus quarters are nearby and the men can be transported there to change to dry clothing and get a coffee break. This helps prevent colds, cuts down sick leaves and improves the morale and efficiency of the men during long drawn-out operations during inclement weather. Some officers believe that in following this practice, there would be less chance of a rekindle, as there would be no need for the men to rush overhauling in order to get back to quarters to change their clothes. This would also permit squad and rescue units to respond from one alarm to another

*Sidney Wohlfeld, the author, recently retired as Battalion Chief of the New York Fire Department, in which he was known as a foremost student of fire suppression.

[1] The author uses the term "protective clothing" in its broadest sense to include everything from helmet to innersoles—Editor.

without returning to quarters to change to dry clothing.

Now, what do we mean by "protective clothing?" Orthodox basic protective clothing for fire departments for many years has consisted of helmet, waterproof coat and rubber boots. Most fire departments specify the type to be purchased, or supply what is desired, and insist that members responding to alarms and operating at fires wear the prescribed gear.

Head protection

Starting with the head gear: A fire helmet should be worn during fire fighting duty to protect the face, neck and ears, as well as the head from the force of a blow, falling objects, water, chemicals, electricity, weather, heat, flame, etc. Helmets are also used in emergencies to break windows for ventilation and entrance; to carry water; and to signify that the owner is nearby and needs assistance. Helmets should identify the owner, his rank, badge number, his departmental unit, and where desired, the name of his city or community.

Present-day helmets are made of leather, metal or plastic. Each type has its own devotees who insist that their type is best, but all three types are in broad use. In some areas the molded-plastic type appears to be gaining in favor, but many large fire departments adhere to the leather and metal patterns.

Helmet design and construction of all types has improved over the years. Present-day patterns are lighter, yet stronger, less tiring on the head and more streamlined than ever. Many have an inner lining or headband, which helps the hat to "ride" the head and cushion any shock.

Waterproof coats

Most firemen prefer the canvas turnout coat because of better ventilation and flexibility during operations, giving more comfort to the wearer. These coats are particularly preferred by rescue and ladder men who must move around quickly and freely but who are not so subject to long wettings by hose streams. However, the canvas coat does not shed water as well as the rubber coat variety during extended operations, when worn under sprinklers and hose streams. Canvas coats sometimes have to have their water repellant chemicals renewed, are more difficut to clean, and are bulkier; however, they are not as subject to drying out and disintegration from heat and chemicals as the rubber coat.

It would seem that the majority of engine men prefer rubber coats, the reasons being that they shed water better over long periods of time, are easier to clean, more easily folded and make a better appearance on the apparatus. Some firemen compromise by wearing the rubber coat during cold weather and the canvas coat during the warm weather. The canvas coat appears to be most popular in warm climates. One accepted advantage of the canvas-type turnout, or "bunker" coat is that an inner-lining can be zipped into or out of it at will.

Left: Latest type reflectorized suit with provision for breathing apparatus cylinder—*Fyrepel Products, Inc. photo.* **Right:** Another variation of the reflective aluminized suit by Wheeler Protective Apparel, Inc.—*Scott Aviation photo*

Foot protection

Some departments recommend that work shoes have steel safety toe caps for protection against falling objects, and to guard the toes from crushing, pinching and cutting hazards. The soles of such shoes should be made of rubber or other non-conductive material to protect against electric hazards and slippery surfaces. Shoe manufacturers have improved the appearance of safety shoes thus cutting down psychological resistance to their use. Generally speaking, the fire fighter prefers boots to shoes, particularly where he must operate in water.

Rubber boots should be worn at fires for protection against acids, chemicals, heat, water, electricity, etc. Boots should be provided with sturdy innersoles made of leather, metal or other compositions, to prevent injury from nails and other sharp objects which may pierce the rubber sole of the boot. The latest type of innersole to receive the attention of the fire fighter is made of laminated nylon, having a special tab to provide extra protection for the vulnerable foot area. Steel safety toe caps are available, and some manufacturers add luminous white or yellow reflective marking to the tip and sole of the boots to aid in locating the wearers in smoky atmospheres.

Some firemen prefer to wear the short or night-hitch boot which comes up to the knee, during warm weather and in warm climates. Some rescue and ladder company personnel prefer to wear work or dress shoes, claiming that they permit greater speed and flexibility during operations in the initial stage; they then change to boots if any extended operations such as overhauling are required.

Continued on following page

Man shown in this test is protected by reflective aluminized insulated material
—Minnesota Mining & Mfg. Co. photo

Fashions in Headgear range all the way from the time-tried leather and the all-metal, to the streamlined plastics. Shown here are (top left) the Fyr-Fyter plastic model with ear flaps and chin strap; (top right) the MSA plastic type, also with ear flaps and chin strap; and (left) the Cairns regulation leather "New Yorker"

Continued from previous page

Heat resistant suits

Heat-resistant suits permit rescue and fire fighting operations under extreme temperatures such as are encountered at airplane, oil fires, etc. They have proved invaluable in shutting off supply valves, entering areas where explosions are imminent due to gas leaks, and performing numerous hazardous operations under trying conditions. The modern coated-fabric suits combine flexibility and ease of performance into an inexpensive, serviceable item of clothing. These suits were originally made of asbestos, but have been improved greatly. The material is now constructed of fiberglass cloth covered with a microscopically thin aluminum layer which reflects up to 95 per cent of the radiant heat from the fire.

Many different styles and types of heat-resistant suits have been introduced over the years. The latest and most efficient type is that which utilizes a fabric coated with aluminum which reflects most of the radiant heat from the fire. The material is fire-resistant, light, strong, impervious to water, grease and oils as well as many chemicals and vapors. It is easily cleaned, readily stored and is said to be long lasting.

Working gloves are a "must" for every fire fighter, as Chief Walter Weaver of Conshocton, Ohio, will agree
—Edmont Mfg. Co. photo

Hand protection

One of the most important, least expensive and most readily available article of clothing is gloves. They will eliminate cuts, scratches, blisters and burns, as well as possible loss of fingers while handling or encountering hot or sharp edged parts. It is a common axiom that rings should not be worn by firemen while on duty, but gloves can aid in preventing rings from catching on protruding objects, which can very easily remove the ring and the finger with it.

Most fire departments supply rubber gloves for rescue companies for use in handling electrical hazards, but not many furnish other work gloves. There is no one particular type of glove that will be satisfactory for the many necessary varied operations a fire fighter must engage in. I have found a gauntlet-type canvas glove with rough leather palms excellent for general truck and engine work. This type of glove is flexible, and the leather protects the fingers and palms, and permits gripping axe and hook handles, even when wet. The gauntlet-type makes for quick dress and removal. Keeping the right glove in the right pocket and the left glove in the left pocket permits donning gloves in the dark, or while responding on apparatus, without fumbling or delay. During cold weather, many veteran fire fighters keep waterproof mitten-type gloves available in a dry spot, for overhauling operations after the fire is under control. Chicago and a number of cities in the cold belt sees the old fashioned woolen unit still popular.

Appropriate types of gloves are needed for specialized operations. A number of rescue units carry an assortment of types dependent upon the kinds of hazards that may be encountered. Rubber gloves used for electrical hazards should be carefully tested and replaced frequently.

Firemen's turnout or bunker coat features (A) duck outer shell; (B) detachable snap-out wool interlining; (C) soft plaid flannel lining; (D) Neoprene interlining
—Globe Mfg. Co. photo

Reflective marking

Reflective sheeting and reflective liquid are used, usually in stripe outlines or numbers, on boots, helmets and coats of firemen to make them visible in dark and smoky atmospheres. This aids in preventing men from getting hit by powerful turret streams, speeds and safeguards traffic control and aids in fire fighting and signalling operations. It also helps the fire officer to keep track of his men, their activities and their rapid location and rescue when injured or overcome. Different colored reflective stripes are used for identifying various branches of the service and reflective numbers identify members.

Goggles and faceshields

Two types of goggles are used to prevent injury to the eyes. They are the cup goggle and the spectacle. The cup goggle shields the entire eye and gives complete protection for severe hazards. The spectacle type is used for light hazards and frontal exposures only.

The cup goggle should always be used when intense radiation, toxic irritating gases, heavy impact or chemical or metal splash may be one of the hazards encountered. Strong rigid plastics and metal are used in the construction of cup goggles and they are formed to facial contours providing a surface that is strong, comfortable and air tight. Cup goggles can be provided with hardened lenses ground to prescription, or can be used to protect ordinary corrective glasses from injury.

Cup goggles sometimes fog up due to condensation of moisture on the inside of the lens, unless they are ventilated. Some gas tight goggles have a water retainer in the cup and by shaking his head the wearer can clear the lenses by splashing

Continued on page 792

Providence fireman overhauling fire on ruined stairway of Classical High School. Intensity of fire can be judged from burned-away risers of stairs

Suspicious Fire Closes Providence High School

Duplicating machine fluid which had been emptied on the basement stairs and then ignited by a "person or persons unknown" was listed as the cause of a $150,000 fire which swept Classical High School, Providence, R. I., on May 6.

The fire department received its first notification at about 10:45 p.m., when an unidentified motorist drove up to the fire station of Engine 3 and reported the 61-year-old, three-story structure on fire.

Lieutenant Thomas McCormack, first officer on the scene, said flames were visible through the Pond Street door of the school as his men forced entrance. By the time Battalion Chief James Coleman arrived on the first alarm, it had been discovered the sprinklers were not working. The chief immediately radioed a second alarm and ordered the sprinklers supplied by hose lines from a pumper. Deputy Chief Hannaway, who arrived on the second alarm, quickly radioed the third alarm.

The fire was largely confined to the corridors where it burned away door frames and wood wall paneling, charred doors and broke windows. It burned through the door to the office of the principal, James F. O'Neil, on the first floor and destroyed much of the paneling but the school records were unharmed. A fire alarm box located on the wall opposite the principal's office was warped and twisted by the intense heat.

The classrooms suffered relative minor fire damage but the intense heat fused many sprinkler heads on the first and second floors and the water damage was extensive. Chief Lewis A. Marshall reported the fire under control about 11:30 p.m. All third-alarm and some second-alarm companies were returned to service at 12:30 a.m. on the 7th. However, some firemen remained at the scene for hours afterward pumping out water and clearing away fallen plaster and debris from the interior.

Battalion Chief Leo E. Gorman, head of the fire prevention bureau, together with police detectives, investigated the fire. Two burned-out cans of duplicating fluid, originally stored in a room on the first floor, were found in the basement at the foot of the central stairway. The flames had spread rapidly from this point up the sprinklered stairs and through the corridors. Maintenance men reported the cans were not there when the school was closed about 4:00 p.m.

The main sprinkler control valve was found to be closed; the entire system had been checked that morning and was reported to be in working order at that time.

No vandalism was discovered, only the two cans of duplicating fluid had been touched. It was reported two youths were seen leaving the school building about 6:10 p.m. and had been driven away in a station wagon.

This was the second fire in the school in a period of 15 months. On February 4, 1957, a fire in the auditorium caused damages of $35,000 and forced the school to close for four days. As a result of this latest fire it has now been closed until further notice.

A heavy rain which fell during most of the fire fighting operations, kept down the number of spectators but police from surrounding posts were called in to control the heavy traffic. Coffee was served to the firemen by the Salvation Army which responded with a mobile canteen.

Promotion Rules Eased For Washington, D. C., Firemen

The District of Columbia Fire Department recently was granted permission to lower its promotion standards in order to meet a shortage of qualified candidates for its higher ranks.

The District commissioners authorized a reduction from 75 to 70 in the qualifying score on promotion examinations; lowered the service requirement from three to two years for sergeants seeking lieutenant positions; and from two years to one year for lieutenants seeking captaincies. Besides changing the standards, the governing body authorized advancing the date for the forthcoming promotion examinations from October to June.

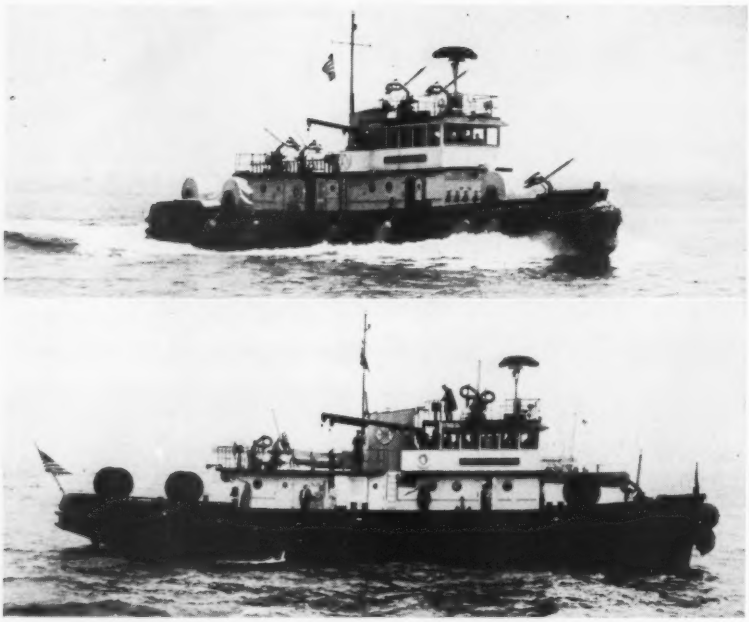
Chief Millard H. Sutton said the department has eight vacant captaincies and that eligible lists for promotion to lieutenant and captain have been exhausted. The sergeants list is also being depleted rapidly, he said.

The situation is said to have been caused by recently enacted retirement legislation which has resulted in an above-normal number of retirements.

—Irving Wallen Johnson, Sr.

New Mexico Firemen Meet

The New Mexico State Firemen's Association held its 34th Annual Conference on June 9-11 at Deming, with Chief Dannie Simonds as host. A highlight of the meeting was a demonstration of jet aircraft fire control and rescue at the Deming Municipal Airport under the direction of Chief C. Jones, Clovis AFB and Deputy Chief C. D. Cathy, Holloman AFB. A large crowd of delegates and guests witnessed the operation.



Top: Engine 51, the H. Sylvia A. H. G. Wilks, under way in New York Harbor. **Bottom:** The fireboat Harry M. Archer, M. D. presently has not been assigned a berth and company number
—NYFD photos by Hellriegel and Heffernan

Two New Fireboats Delivered to New York Fire Department

The New York Fire Department has taken delivery of two new fireboats, the "H. Sylvia A. H. G. Wilks," named in memory of a woman who bequeathed $3 million to the fire department honor fund; and the "Harry M. Archer, M.D.," named in memory of the renowned doctor who labored over 60 years for the city firemen.

The twin vessels were designed by the New York firm of H. Newton Whittelsey, Inc., naval architects and marine engineers, and built by the John H. Mathis Co., Camden, N. J., at a cost of over $857,000 each.

Variable pitch propellers

The hulls are of all-welded steel with over-all length of 105½ feet, 25½-foot beam amidships, maximum draft of 9 feet and a displacement of 292 tons. Propulsion engines are twin Enterprise diesels of 510 hp each driving controllable pitch propellers giving speeds of up to 14 mph.

The installation of the new type propellers is said to be the first of its kind on a fire boat. It is expected they will give a fineness of control not heretofore possible and will hold the vessels stationary against tide currents and the reaction of the monitor nozzles.

The main fire pumps are driven by twin engines of the same make as the driving engines. Each pump is a Worthington single-stage centrifugal rated at 4000 gpm at 150 psi. The pumps discharge into a 14-inch header with a total rated output of 8000 gpm at 150 psi or 4000 gpm at 300 psi. The header supplies the various manifolds and monitor nozzles.

Remote control monitor

Each boat is equipped with five hydraulically operated 6-inch Chicksan monitors; the bow monitor is remotely controlled from the pilot house.

In addition, each is fitted with two hose manifolds with six outlets for 3½-inch hose and a 500-gallon 3 per cent liquid foam system. Foam is supplied through a pump to a special manifold with four 2½-inch hose outlets located aft of the main deck house.

Power for the electric system is supplied by a General Motors diesel-driven 30-kw generator with a second 30-kw generator on emergency stand-by. Each boat is equipped with two floodlights and two 875,000-candlepower searchlights. The engines used to drive the electric generators also may be used to drive a two-stage air compressor. The latter will be used for driving pavement breakers and chipping hammers employed for access to under-pier fires, etc. Electronic equipment includes Decca radar and Motorola two-way radio.

The twin fireboats mark completion of the first step in the city's plan to standardize on its marine fleet. Another boat built to the same design specifications will be ordered shortly.

Haverhill Firemen Protest Police Duty

Integration is getting its tryout in Haverhill, Mass., notwithstanding the strenuous objections of fire fighters. It is believed this is the first New England municipality to experiment with merger of fire and police. Stamford, Conn., some time ago toyed with the idea of making firemen traffic officers to do crossing duty, but the trial died aborning.

In Haverhill, two firemen set out in police cruisers the night of July 1 for their first six-hour tour of "fire-watch" duty, at the start of a 30-day trial period. They did so under protest of the International Association of Fire Fighters, AFL-CIO, Local 1011.

Most of the wrath of fire fighters is directed at City Manager Gilbert D. Chavanelle who issued the order, and set the duties of the fire fighters on police patrol. These duties include the directing of traffic at accident scenes, maintenance of a fire watch, and acting as radio operator in the absence of a policeman. In addition, they will be required to try doors while on patrol.

Allan Lamond, president of the IAFF Local, protested that fire fighters took civil service examinations to qualify as firemen, not policemen. The move, he said, "is without question an infringement on the civil service status of the firemen." Firemen are trying to get a decision that will protect the rights of all workers under civil service, said George Karelitz, counsel for Local 1011, and he added, "what would prevent city officials from putting policemen into schools as custodians, or highway workers on the fire department?"

Editor's Note: The joint patrol experiment was discontinued by the city manager on July 29 after a conference with Fire Chief William B. Hunt and Police Chief William A. Ross.

On July 26 one fire fighter was suspended for three days following his refusal to ride in a police car.

New Insurance Rating Schedule for New York Farm Buildings

The New York Fire Insurance Rating Organization has announced two new classifications for rating farm barns and outbuildings in the state with lowered insurance rates given to those who qualify.

Class "E" covers properties within five miles of an approved available fire department equipped with a 500-gpm pumper and a water tank or tanks having a capacity of not less than 500 gallons. A telephone must be provided on the premises of the insured.

Class "F" covers properties protected as above, but in addition, are within 1,000 feet of an approved hydrant, farm pond, dammed stream or other water source with a minimum flow of 250 gpm or 15,000 gallons capacity.

WHAT'S NEW

Among the Manufacturers

- products
- processes
- personalities

ALF-Herman Corporation Formed

J. C. Esher, vice president and general manager, announces the formation of ALF-Herman Corporation, a subsidiary of American LaFrance of Elmira, N. Y., as successor to the Herman Body Co. This company has been formed to continue building Herman bodies, and to expand operations under the new name and new management. Operation of plant and offices continues at 4402 Clayton Avenue, St. Louis 10, Mo.

New Motorola Mobile Unit

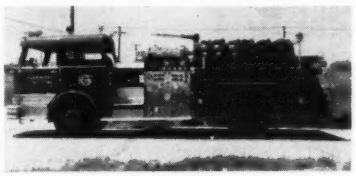
Motorola Communications and Electronics, 4501 West Augusta Boulevard, Chicago 51, Ill., has announced a new mobile radiophone operating in the 450-470 mc band. It utilizes transistors in the power supply which operates from 12-volt electrical systems and provides 18 watts power output.

Stand-by Generator

Kohler Co., Kohler, Wis., announces production of a new large capacity electric plant, Model 25R81, a 25-kw, 120/-208-volt A.C. equipped for remote starting. The new high-output plant is recommended by the manufacturer as a stand-by power source for hospitals, municipal buildings, mobile communication centers and many similar applications.

New "Approved" Pumper

Approved Fire Equipment Co., Island Park, L. I., N. Y., has recently delivered a new cab-forward 1,000-gpm pumper to the Glenwood Fire Company, Glenwood Landing, N. Y.



Powered by a 300-hp Waukesha engine, it is equipped with electric rewind booster reels, a permanently mounted deck gun piped to the pump as well as to a rear intake, and a built-in foam system.

New Audio Hailer Megaphone

A new transistor-powered portable megaphone, said to project speech over half a mile, is announced by Audio Equipment Company, Inc., 74 Harbor Road, Port Washington, N. Y. The unit operates on standard flashlight cells, uses four power transistors to produce an output of 7 watts, 115 db and weighs only 5¾ pounds. It is possible to install a complete new "TP" chassis in tube-type Hailer units now in use.

Tracerlab Gives Radiation Training to Waltham Firemen

Twelve members of the Waltham, Mass., Fire Department recently attended a refresher course in isotope handling at Tracerlab, Inc., Waltham 54, Mass.

The purpose was to provide the firemen with fundamental knowledge in the handling of isotopes and radiation detection instruments.

In the accompanying photo are: (left to right, front) Deputy Chief Frank Flood, Captain Edward Wallace, Deputy Chief Edward A. Cloonan, Deputy Chief Lawrence McIvor, Inspector Harold Bardsley, Deputy Chief Charles Eagan; (far left standing) Tracerlab health physicist William Karp; (rear) Lieutenant Robert Hoffses, Lieutenant Albert Smith, Captain Charles Small, Private James Neufell, Lieutenant Francis Fair, Lieutenant John Burke.

Aerial Ladder Intercom

Fi-Tronics Engineering, 507 Beech Tree Lane, Wayne, Pa., announces the development of the "Towercom" aerial ladder intercommunication system.

Employing a 6 or 12-volt transistor amplifier and two reflex speakers, one located at the ladder tip and the other at the turntable pedestal, the system permits the fly man to talk to the ladder operator without using his hands to hold a microphone or touch a switch. The turntable operator uses a push-to-talk switch to reply.

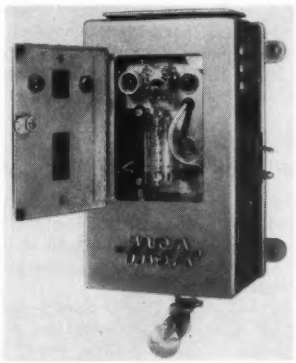
Connecting cable is stored in a spring-loaded reel mounted on top of the bed ladder and automatically extended and retracted by ladder movement.

Super Fyr-Strype Patented

The Fyr-Fyter Co., 221 Crane St., Dayton 2, Ohio, has been issued Patent No. 2,833,313 covering the Dacron strips which are designed to protect and reinforce the fold area of its "Super Fyr-Strype" municipal fire hose.

New MSA Gas Alarm

The Explosilarm, a small self-contained combustible gas alarm, is announced by Mine Safety Appliances Company, Pittsburgh 8, Pa. It is intended



for installation in non-hazardous areas with a sample line as long as 100 feet and can be used advantageously in industrial plants, refineries, etc., wherever any combustible gas is used. It is contained in a cabinet 14¼ inches high.

New ADT Film

The dramatic, behind-the-scenes story of modern automatic fire and burglary protection is excitingly told in a new color movie, "When Every Minute Counts," recently released by American District Telegraph Company.

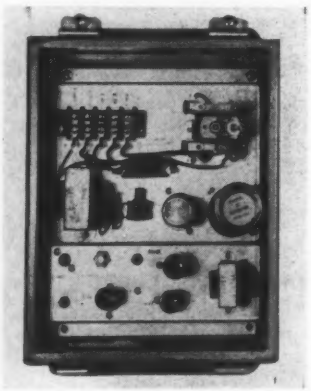
Filmed in Hollywood in cooperation with the Los Angeles Fire and Police Departments, the film shows how latest electric and electronic systems safeguard property by quickly summoning police or fire fighters.

The 22-minute film is available in 16mm color for general showings and in

black and white for television. Requests for local showings should be made through the ADT Executive Office, 155 Sixth Avenue, New York 13, N. Y. Two weeks advance notice should be given in requesting loan of a print for a definite date, and two alternate dates should be included.

Radio Control System

Perma-Power Co., 3100 North Elston Avenue, Chicago, Ill., has designed a radio-controlled switching system which can be used to control any electrical device and is useful for alerting volunteer firemen.



It consists of a transmitter, receiver, antennae and mounting hardware and is designed for either 115 volt A.C. or 6 or 12 volt D.C. Units are available with up to 12 separate channels.

Rockville Center's New Aerial

The Rockville Center, LI, N. Y., Fire Department has recently taken delivery of a new 100-foot aerial which is being acclaimed for its outstanding construction features.

The semi-cab, tractor-drawn ladder, built by American LaFrance Corp. to the specifications of the Eureka Hook, Ladder and Bucket Co., No. 1, is powered by a 300-bhp Continental 6-cylinder engine and is equipped with air brakes on all wheels.

The steel ladder is equipped with a sound-powered telephone intercommunication system connecting the control pedestal and the tip of the fly. A 6-foot pile pole and a flat head axe are mounted on the fly and a lightweight ladder pipe may be used on the ladder and fed by 100 feet of 3-inch hose through a 2½-inch by 3-inch three-way gated siamese. The ground ladder complement totals 253 feet.

A Leece-Neville alternator provides 12 volts DC for the electrical system and a Motorola 30-watt mobile radio as well as 120 volts AC through a 1200-watt transformer for the two portable floodlights.

The vehicle is equipped with 26 individual compartments each holding a helmet, turnout coat and pair of boots. Practically all of the remaining open space is fitted with compartments including one for storage of an Atlas life net.

More High Pressure Pumpers for Philadelphia

The eight combination high pressure fog and volume pumpers lined up in the photograph were recently delivered to the Philadelphia, Pa., Fire Department. Built by John Bean Division, Food Machinery and Chemical Corporation, Lansing, Mich., on special open-cab GMC chassis.

New Home for Reviv-A-Life

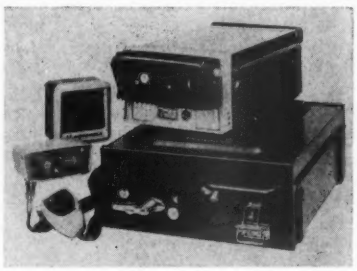
To provide for larger production and world-wide distribution, exclusive rights to manufacture Reviv-A-Life resuscitators and use of the copyrighted name has been transferred from Midwest Oxygen Equipment Corp. to Oxygen Equipment and Service Co., 8335 South Halsted Street, Chicago 20, Ill.

FEMA Meets in Pittsburgh

The Fire Equipment Manufacturers' Association will hold its next general membership meeting on August 26 in the Greater Pittsburgh Airport Hotel.

This national trade association is composed of 16 member-companies who make and market portable fire extinguishers and related equipment.

Motorola 100-Watt Mobile Radio



Motorola Communications and Electronics Inc., 4501 West Augusta Boulevard, Chicago 51, Ill., has announced a 100-watt mobile unit in which four transistors are used to replace both the vibrator and dynamotor.

Alco-Lite Fiberglass Straight and Extension Ladders

The Aluminum Ladder Co., Worthington, Pa., has introduced its new Alco-Lite fiberglass straight and extension ladders which reportedly are ideal for use around electricity and chemicals.

According to the company's announcement, the ladder siderails are made of fiberglass with rungs of aluminum. Tests by a leading power company indicate it is practically impossible to be injured by electricity due to the ladder coming in contact with high voltages; 75,000 volts is said to be needed to flash an arc between any two rungs.

The new products meet A.S.A. Code A 14.2 for portable metal ladders and are said to be non-absorbent; also, prolonged exposure to moisture, chemicals and acids has no appreciable effect.

The new ladders are available in lengths from 12 to 16 feet (straight-type) and to 29 feet (extended), and weigh from 18 to 55 pounds.

Continued on page 754

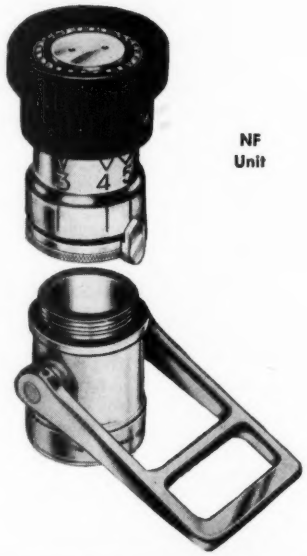
THE Fyr-Fyter NEWS
(FIRE) (FIGHTER)
FIRE DEPARTMENT EDITION

NO. 6 PUBLISHED MONTHLY BY THE FYR-FYTER CO., DAYTON, OHIO AUGUST 1958

NFPA Defines Basic VFD 'Equipment' Requirements

Of special interest to fire departments everywhere are the new "revisions" to the NFPA Standard (Pamphlet No. 192) on the subject of the most proper nozzles and fittings for volunteer fire departments.

The revisions, which were adopted at the 62nd Annual Meeting of the NFPA in Chicago from May 19 to 23, will be incorporated in a reprint of NFPA Pamphlet No. 192A.



NF Unit

Either more hose or an applicator can be attached to the end of this cushion ball shut-off . . . a new feature in Fyr-Fyter's Vari-A-Fog Nozzles. When hose is added, the NF is a complete fire fighting unit, since it will shut off the stream when turned below the straight stream setting.

The Fyr-Fyter Company, as a public service, herewith publishes these all important revisions so that members of volunteer fire departments, in particular, can retain this special edition of the Fyr-Fyter News for reference purposes:

"Nozzles control the amount of water and the shape or type of stream that will be discharged. Modern practice utilizes nozzles which will provide either a straight stream or a spray . . . nozzles for 1" hose normally discharge from 15 to 30 gallons per minute. Nozzles for 1½" fire hose normally discharge from 50 to a little over 100 gallons per minute, depending upon the type selected and the pattern of the stream. For the larger discharge figure, pressure losses in the hose are quite high and may require excessive pressures. Nozzles for 2½" hand lines have capacities ranging from 150 to 325 gallons per minute. (Note—See page 2 of this special issue for a photograph and brief description of 1", 1½" and 2½" Vari-A-Fog Nozzles. Also, see chart on page 4 of this issue which indicates the GPM discharge of these Vari-A-Fog nozzles.)

Be sure to visit Booth Nos. 32, 33 and 68 at the IAFC Convention in Los Angeles during September.

Several Nozzles Needed

"There should be sufficient nozzles carried on each piece of apparatus to provide effective fire streams under all conditions and to permit use of streams from all of the pump outlets.

"This means that there should be a booster hose nozzle for each reel, at least two 1½" nozzles and a 2½" shut-off nozzle for each 2½" discharge connection. Combination spray nozzles are desirable for all sizes of hose, but tips should be available to provide solid streams from 2½" hose, i.e. from ⅞" to 1¼" tips. The smaller capacity tips would be needed when water supply is limited or in order to limit friction loss in long hose lines. The larger capacity tips would be employed if water supply permits, for attacking large fires.

"One mistake commonly made is to use ¾" or even ⅝" tips on 2½" nozzles. This is a hold-over from the days of inadequate pumps and before 1½" fire hose was generally available. These small tips reduce the flow to 80 to 120 gallons per minute. Such small flows can be better handled through 1½" hose lines and nozzles. The nozzles for 2½" lines should have 1½" hose threads at the shut-off valve and tip to permit reducing the line to 1½" hose if the larger stream is not needed.

Fyr-Fyter's NGM-2 manually operated 2-inlet Geyser is used by fire departments everywhere.

(Note—Many fire fighting engineers like the more versatile features incorporated in the Vari-A-Fog nozzles with the "break-apart" feature. It has your choice of municipal threads between the

Continued on page 4

Fyr-Fyter Has 'Everything' in Fire Equipment . . .

Vari-A-Fog Nozzles

You simply dial your stream pattern—from a 90 degree wide angle right down to a straight stream—with Fyr-Fyter's "Wooster" Vari-A-Fog Nozzles in 1", 1½" and 2½" sizes.

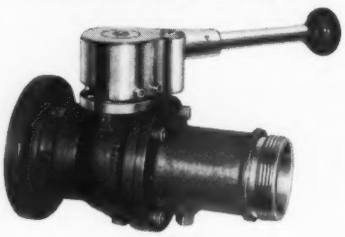
NVF15

Deluge Nozzles

Portable and permanent mounted deck pipes for all types of fire apparatus including fire boats, etc.

This NGW3 Geyser Nozzle uses the maximum capacity of 2½" lines.

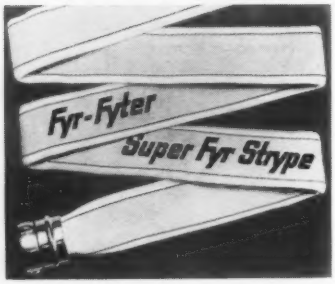
Control-Flo Valves



VA25GC

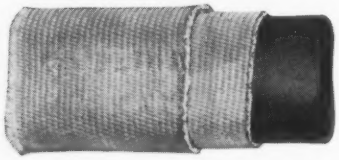
A floating ball seal, full round water-way, rugged positive brake, convenient splined handle and many other features are incorporated in Fyr-Fyter's Control-Flo Valves. They take pressure or vacuum in either direction. Holds on prime as well as discharge because of seals and bulk ends. They are easy to repair, rugged, leakproof and quick acting. Control-Flo valves are made in four sizes: 1", 1½", 2" and 2½".

Super Fyr-Strype



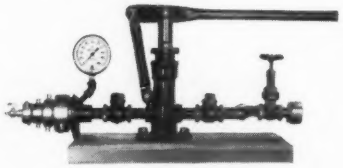
It's patented! No other manufacturer can duplicate the 100% Dacron strips over the total outer jacket fold areas of this top-line municipal fire hose. This double jacket 600 lb. test hose is available in either 1½" or 2½" sizes!

Super Fyr-Flex XL



The extra-light weight of Super Fyr-Flex XL is made possible by the use of extra-long staple cotton, chemically treated to retain flexibility and to provide added strength. This top grade municipal hose has Dacron filler cords which provide at least 10% more strength. Available in 100 ft. lengths. These longer lengths can be put into action much quicker . . . and because of its extra light weight, Super Fyr-Flex XL requires less time and space to fold and pack.

'Test' Equipment



Used to test fire hose, extinguishers and any other item where static pressures up to 600 lbs. are required. Quick, convenient and portable. All you need is a garden hose outlet as a water source. Body painted red, 1000-lb. brass gauge. Specify thread sizes when ordering. Extinguisher test attachment may be purchased. This includes clamp, hose and swivel fitting for tightening extinguisher nozzle to discharge end of test hose so hose and extinguisher can be tested at same time.

Firemen's Clothing

A complete line of duck and rubber coats are available through Fyr-Fyter Sales and Service representatives.

Extinguishers

"Apparatus type" pressurized heavy-duty steel dry chemical extinguishers are now available in 10 lb., 20 lb. and 30 lb. sizes. These units were designed to withstand the roughest abuse and are protected with sturdy gauge guards. A 10 lb. model is illustrated at the left.

Model 26-5

Fyr-Fyter Boots

Fyr-Fyter boots have shock proof insoles, cleated type outsoles, are felt covered and furnished with pull-on loops. All sizes available.

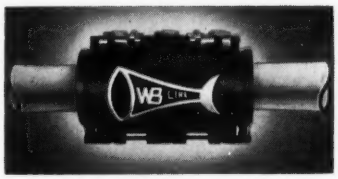
. . . More Than 1,200 Fire Protection Products

Manga-Forge Couplings

CMF25

The strength of manganese combined with ring reinforcement in the expansion area are two of the many design features that prevent Manga-Forge couplings from going "out of round" under impact and stress. Manga-Forge couplings will not slip, creep or blow off at any fire pump pressure. Lighter in weight than most couplings.

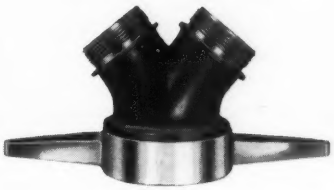
Hose Jackets



HJ25

For stopping leaks or ruptures in hose lines without shutting off the line, use Fyr-Fyter's Trumpet HJ25 Hose Jacket. Also used as an emergency coupling adapter for connecting two differently threaded hose lines. Jacket is made of reinforced cast aluminum for light-weight, easy operation. Liners are synthetic rubber and constructed to give a tight seal at all points. Spring snap locks of bronze snap tight with one easy motion. Length of unit is 12½", weight 13½ lbs.

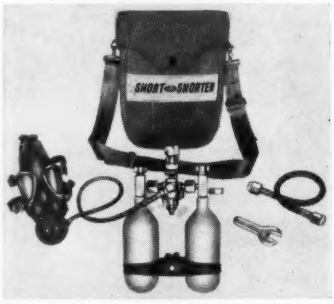
Plain Siamese



SRH501

The SR series of Siamese or Wye is made with one 3" to 6" swivel or male and with two 2½" males or female swivels. For use at hydrant or pumper in relaying to pumper from hydrant using 2½" hose. Inlets and outlets finished polished chrome plated unless otherwise specified. Body painted red. Regularly furnished with long handles on large end. Rocker type lugs on 2½" swivels when furnished. Be sure to specify male or female and thread dimensions.

Short Snorter



Designed for quick entry into toxic atmospheres, the Short Snorter is an ideal unit for fire chiefs for inspection purposes. It weighs only 15 lbs. and yet has sufficient air or oxygen to permit the wearer to breathe in any toxic atmosphere for over 15 minutes.

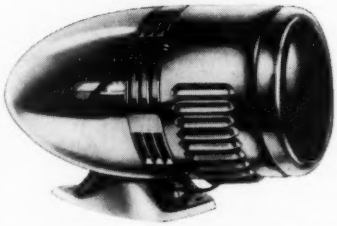
Foam Compound

High and low expansion foam compounds are available and will operate efficiently when used in solution with hard or soft water, fresh or sea water. Fyr-Fyter has a complete line of air foam compound and equipment.

Wet Water

Makes water three times as effective and inhibits rust! Extremely effective on blazes in combustible materials since wet water penetrates and extinguishes faster than ordinary water. Cannot harm a fireman's skin and mixes instantly and readily with water.

Fyr-Fyter Sirens



Fyr-Fyter has all types of flashing lights and sirens . . . signals that you will be proud to place on your apparatus. They're streamlined and chrome plated. Write today for a copy of Fyr-Fyter's new 92-page Accessory Catalog. This catalog illustrates more than 1200 fire department products.

SAFA Fire Boxes

Fyr-Fyter also manufactures municipal and industrial Central Station control equipment including fire boxes as well as recording equipment and various alarm devices such as gongs, bells, horns and sirens. This equipment bears the dependable SAFA manufacturing label.

CO2 Units

Fyr-Fyter's ruggedly constructed carbon dioxide extinguishers are ideal fire protection units on your apparatus. All Fyr-Fyter CO2 extinguisher cylinders are constructed of high pressure steel and are fitted with strong forged brass discharge valves.

Model 34-1

'Must Equipment' for Volunteer Departments

Continued from page 1

shut-off and the stream dial quick control unit. The latter is a complete fire fighting unit, since it will shut off the stream when turned below the straight stream setting. Either more hose or an applicator can be attached to the end of the ball shut-off. When hose is added, the stream dial quick control unit can be attached to the discharge end and is a complete nozzle unit in itself.)

"The use of proper sized nozzles and tips is essential if satisfactory and effective fire streams are to be produced within the rated capacity of the pump.

Fyr-Fyter's NCR-15 Revolving Cellar Nozzle which fire departments have found extremely useful in applying water to areas that are difficult to reach. This model is self-revolving from the force of the water.

"In addition to the general hand line nozzles, there are a number of other useful type of nozzles that may be carried. These include extension applicators with spray tips that are useful on flammable liquid fires and distributors designed to provide an effective spray for cellar fires and other fires in concealed areas.

"Another important nozzle in connection with rural fire fighting is a heavy stream appliance capable of applying the full capacity of a pumper in a single stream of water. Many rural fires involve large structures requiring streams of greater range and capacity that can be provided with individual hand lines. Frequently, water is available from suction sources which make possible application of heavy streams if a light-weight portable turret is available. It is recommended that for rural work a 400 to 500 gallon per minute spray nozzle be provided for such portable turrets, as well as solid stream tips. A 1⅜" solid stream tip will utilize the rated capacity of a 500 gallon per minute pumper at low pressures, while a 1¼" tip will utilize the full flow of the 500 gallon per minute pumper at higher pressures. (Note—see page 2 for illustration of the NGW-3 Geyser Portable Deluge unit which is capable of discharging up to 1350 GPM.)

Choose 'Serviceable' Nozzle

"It is highly desirable to have spare nozzles for each size of hose. Nozzles have valves and working parts that need repair and adjustment from time to time making the spare nozzles highly desirable. Also, there are many situations where it will be possible to provide additional streams of water if extra nozzles are available. (Note—The Vari-A-Fog line of nozzles are considered to be the easiest to service in the fire equipment industry. These nozzles incorporate removable bases which means, in effect, that the shut-off ball and the seals can easily be removed for inspection and servicing.)

"Certain other fire hose fittings are important for rural and small community fire departments. These include double-male and double-female fittings for 2½" hose which permit reversing the connections of a hose line. Also desirable are siamese connections for 2½" hose which permit combining two lines to provide one heavier stream. (Note—See illustration of "plain siamese" on page 3.) Another standard item is a 2½" Wye, which may be equipped with hose gates. This permits two lines to be taken off a single 2½" connection. Frequently provided are Wyes which provide two or more gated 1½" outlets from a single 1½" or 2½" supply. A "Water Thief" with a gated 2½" and a two-gated 1½" outlets is even more desirable. Where non-standard threads may be encountered, pairs of adapters should be provided for each non-standard thread. Adapters are needed to connect standard male fittings to non-standard female fittings and vice versa. Adapters commonly found necessary or desirable in rural work permit connection of fire department booster hose to garden hose threads and connection of fire department 1½" thread to 1½" pipe thread or to forestry thread. Where available hydrant outlets have a different thread from suction hose, an adapter from the suction hose thread to the hydrant thread is required. It is also generally desirable to have a swiveled adapter that will permit connection of the pumper suction hose to 2½" male outlets.

This WT-3-VB Trumpet Water Thief increases the efficiency of any department. Two 1½" lines can be laid from a 2½" main line, and the 2½" line continues to be available.

Be sure to visit Booth Nos. 32, 33 and 68 at the IAFC Convention in Los Angeles during September.

Gated Inlets Necessary

"One other hose connection that is very important for rural and small community fire fighting is the 2½" gated inlets to the pumpers. While NFPA No. 19 Specifications for Motor Fire Apparatus, calls for at least one 2½" gated inlet for pumpers including booster pumps, it is quite important for rural fire fighting where pumps must be supplied in line by relay, to have at least two 2½" pumper inlet connections on all pumps of 500 gallons per minute capacity or larger."

FOG NOZZLE DISCHARGES—GALLONS PER MINUTE

NOZZLE PATTERN VARI-A-FOG SETTING		75-LB. NOZZLE PRESSURE					100-LB. NOZZLE PRESSURE					125-LB. NOZZLE PRESSURE					NOTE: THE FIGURES IN THIS CHART ARE AVERAGE PERFORMANCE AND WILL VARY WITH NOZZLE POSITION, WIND, AND OTHER WEATHER CONDITIONS.
		STR. STRM.	15° ▼	30° ▼	60° ▼	90° ▼	STR. STRM.	15° ▼	30° ▼	60° ▼	90° ▼	STR. STRM.	15° ▼	30° ▼	60° ▼	90° ▼	
NOZZLE SIZE	RATED GPM	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	
¾" & 1"	20	16	18	20	24	27	20	22	24	29	34	22	25	27	32	37	STANDARD FOR VARI-A-FOG, FOG KING, NIF AND NHR
1"	40	25	29	32	38	45	32	36	40	45	50	35	40	44	53	62	AVAILABLE IN VARI-A-FOG, FOG KING AND WITH 1½" THREAD FOR NIF OR NHR,
1½"	75	48	54	60	72	85	60	67	75	90	105	65	75	83	100	115	AVAILABLE IN VARI-A-FOG AND FOG KING. STANDARD FOR NIF AND NHR
1½"	100	64	72	80	96	110	80	90	100	120	140	88	100	110	130	150	AVAILABLE IN VARI-A-FOG NIF AND NHR, STANDARD FOR FOG KING
1½"	125	80	90	100	120	140	100	118	125	148	175	110	125	140	170	200	AVAILABLE IN FOG KING, NIF AND NHR, STANDARD FOR VARI-A-FOG
2½"	200	130	145	160	190	220	160	180	200	240	265	180	200	220	265	300	AVAILABLE IN VARI-A-FOG AND FOG KING
2½"	300	190	215	240	290	340	240	270	300	360	420	270	300	330	395	450	STANDARD FOR VARI-A-FOG AND FOG KING
MASTER	500	320	360	400	480	560	400	450	500	600	700	450	500	550	660	760	STANDARD FOG MASTER — OTHER GPM'S ON SPECIAL ORDER
MASTER	1000	640	720	800	900	1000	800	900	1000	1100	1200	900	1000	1100	1200	1300	STANDARD FOG MASTER — OTHER GPM'S ON SPECIAL ORDER

WHERE TO BUY

Directory of Equipment For Fire Departments

This special feature is provided for the guidance and convenience of fire officials and others concerned with the purchase of fire equipment. The companies listed comprise those whose products have recently been advertised in FIRE ENGINEERING and are thus now actively serving the fire protection field. For information on any type of equipment not listed, address Readers' Service Dept., FIRE ENGINEERING, 305 East 45th St., New York 17, N. Y.

Every effort is made to insure the completeness and accuracy of directory sections. However, this information is published as a service, and no guarantee against errors or omissions is expressed or inferred. Additions or corrections are invited at any time. Please address the publisher.

APPARATUS, MOTOR

APPARATUS

Ambulances

Christopher Co., The
Hess & Eisenhardt Co.
International Harvester Co., Motor Truck Div.
Miller-Meteor Motor Car Div., Divco-Wayne Corp.
National Coaches, Inc.
Sharpsville Steel Fabricators, Inc.
Superior Coach Corp.

Chassis

Approved Fire Equipment Co., Inc.
Ford Motor Co.
Four Wheel Drive Auto Co.
GMC Truck & Coach Div.
H. & H. Fire Apparatus, Inc.
International Harvester Co., Motor Truck Div.
Maxim Motor Co.
Pirsch, Peter, & Sons Co.
Seagrave Corporation

Crash Trucks

American Fire Apparatus Co.
American LaFrance Corp.
Approved Fire Equipment Co., Inc.
Bean, John Div., Food Machinery & Chemical Corp.
Boardman Co., The, Fire Apparatus Div.
Christopher Co., The
Darley, W. S., & Co.
Fire Fighter Truck Co.
Four Wheel Drive Auto Co.
Gold Crest Safety Equipment Corp.
H. & H. Fire Apparatus, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co.
International Harvester Co., Motor Truck Div.
Kidde, Walter & Co., Inc.
Mack Trucks, Inc.
Maxim Motor Co.
Oren Roanoke Corp.
Sharpsville Steel Fabricators, Inc.
Universal Fire Apparatus Corp.
Valley Fire Truck Co.
Young Fire Equipment Corp.

Foam Trucks

American LaFrance Corp.
Approved Fire Equipment Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Boardman Co., The, Fire Apparatus Div.
Fire Fighter Truck Co.
Four Wheel Drive Auto Co.
H. & H. Fire Apparatus, Inc.
Howe Fire Apparatus Co.
Mack Trucks, Inc.
Maxim Motor Co.
National Foam System, Inc.
Seagrave Corporation
Sharpsville Steel Fabricators, Inc.
Young Fire Equipment Corp.

Industrial Trucks (In Plant)

Bean, John, Div., Food Machinery & Chemical Corp. (Self-Propelled & Stationary)
Darley, W. S., & Co.
Young Fire Equipment Corp.

Ladder Trucks, Aerial

American Fire Apparatus Co.
American LaFrance Corp.
Approved Fire Equipment Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S. & Co.
Fire Fighter Truck Co.
Four Wheel Drive Auto Co.
Howe Fire Apparatus Co.
Mack Trucks, Inc.
Maxim Motor Co.
Oren Roanoke Corp.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Uddstrom, P. R., Co.
Universal Fire Apparatus Corp.
Young Fire Equipment Corp.

Ladder Trucks, Service

American Fire Apparatus Co.
American LaFrance Corp.
Approved Fire Equipment Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Christopher Co., The
Darley, W. S., & Co.
Four Wheel Drive Auto Co.
H. & H. Fire Apparatus, Inc.
Halprin Supply Co.
Mack Trucks, Inc.
Maxim Motor Co.
Oren Roanoke Corp.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Uddstrom, P. R., Co.
Universal Fire Apparatus Corp.
Valley Fire Truck Co.
Young Fire Equipment Corp.

Pumpers And Hose Cars

American Fire Apparatus Co.
American LaFrance Corp.
Approved Fire Equipment Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Boardman Co., The, Fire Apparatus Div.
Christopher Co., The
Darley, W. S., & Co.
Fire Fighter Truck Co.
Four Wheel Drive Auto Co.
Gold Crest Safety Equipment Corp.
H. & H. Fire Apparatus, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co.
Mack Trucks, Inc.
Maxim Motor Co.
Oren Roanoke Corp.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Sharpsville Steel Fabricators, Inc.
Universal Fire Apparatus Corp.
Valley Fire Truck Co.
Young Fire Equipment Corp.

Pumpers, High Pressure Fog

American Fire Apparatus Co.
American LaFrance Corp.
Approved Fire Equipment Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Boardman Co., The, Fire Apparatus Div.
Christopher Co., The
Darley, W. S., & Co.
Fire Fighter Truck Co.
Four Wheel Drive Auto Co.
H. & H. Fire Apparatus, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co.
Mack Trucks, Inc.
Maxim Motor Co.
Oren Roanoke Corp.
Pacific Marine Supply Co.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Sharpsville Steel Fabricators, Inc.
Universal Fire Apparatus Corp.
Young Fire Equipment Corp.

Rescue and Squad Trucks

American Fire Apparatus Co.
American LaFrance Corp.
Approved Fire Equipment Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Boardman Co., The, Fire Apparatus Div.
Christopher Co., The
Darley, W. S., & Co.
Four Wheel Drive Auto Co.
Gold Crest Safety Equipment Corp.
H. & H. Fire Apparatus, Inc.
Howe Fire Apparatus Co.
International Harvester Co., Motor Truck Div.
Mack Trucks, Inc.
Maxim Motor Co.
Oren Roanoke Corp.
Pirsch, Peter, & Sons Co.
Sharpsville Steel Fabricators, Inc.
Universal Fire Apparatus Corp.
Valley Fire Truck Co.
Young Fire Equipment Corp.

Tank Trucks

American Fire Apparatus Co.
American La France Corp.
Approved Fire Equipment Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Boardman Co., The, Fire Apparatus Div.
Christopher Co., The
Darley, W. S., & Co.
Fire Fighter Truck Co.
Four Wheel Drive Auto Co.
Gold Crest Safety Equipment Corp.
H. & H. Fire Apparatus, Inc.
Howe Fire Apparatus Co.
International Harvester Co., Motor Truck Div.
Maxim Motor Co.
National Foam System, Inc.
Oren Roanoke Corp.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Sharpsville Steel Fabricators, Inc.
Universal Fire Apparatus Corp.
Young Fire Equipment Corp.

Utility and Repair Trucks

Approved Fire Equipment Co., Inc.
Boardman Co., The, Fire Apparatus Div.
Christopher Co., The
Darley, W. S., & Co.
Fire Fighter Truck Co.
Ford Motor Co.
Four Wheel Drive Auto Co.
Gold Crest Safety Equipment Co.
H. & H. Fire Apparatus, Inc.
International Harvester Co., Motor Truck Div.
Oren Roanoke Corp.
Sharpsville Steel Fabricators, Inc.
Universal Fire Apparatus Corp.
Young Fire Equipment Corp.

BATTERIES APPARATUS

Delco-Remy Div., General Motors Corp.
Ford Motor Co.
Harrington Signal Co.
Ray-O-Vac Co.

BATTERY CHARGERS

Darley, W. S., & Co.
Halprin Supply Co.
Harrington Signal Co.
Notifier Corp.
Onan, D. W., & Sons, Inc.
Pioneer Gen-E-Motor Corp.

BRAKES, POWER, HYDRAULIC

Power Equipment Co. (emergency, lock & hand)

ENGINES (Diesel or Gas)

Continental Motors Corp.
Detroit Diesel Engine Div., General Motors Corp.
Hall-Scott (available through Hercules)
Mack Trucks, Inc.
Onan, D. W., & Sons, Inc.
Waukesha Motor Company

GENERATORS, AUTOMOTIVE
Darley, W. S., & Co.
Delco-Remy Div., General Motors Corp.
Ford Motor Co.
Leece-Neville Co., The

HARDWARE FOR APPARATUS
Darley, W. S., & Co.
Eastman, Samuel Co., Inc.
Hein-Werner Corp.
Fyr-Fyter Co., The
Halprin Supply Co.
Mack Trucks, Inc.
Universal Fire Apparatus Corp.

LADDERS, AERIAL
American LaFrance Corp.
Four Wheel Drive Auto Co.
Mack Trucks, Inc.
Maxim Motor Co.
Memco Aerial Ladder Co.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Uddstrom, P. R., Co.

POWER STEERING, HYDRAULIC
Ford Motor Co.
Garrison Mfg. Co., Inc.
Mack Trucks, Inc.

SEAT BELTS
Bullard, E. D., Co.
Ford Motor Co.
Rupert Safety Belts, Div. Rupert Parachute Co., Inc.

SIGNS & EMBLEMS, APPARATUS
B & C Products Co.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Gold Crest Safety Equipment Corp.
Greenberg's, M., Sons
Halprin Supply Co.
Kelco Supply Co.
Lane, E. B., Distributor (Plastic Emblems)
Maxim Motor Co.
Nielson-Rionda, Inc.
Pacific Reflex Signs
Wentworth-Forman Co., Inc.

WARNING DEVICES, APPARATUS

Bells
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
H. & H. Fire Apparatus, Inc.
Halprin Supply Co.
Harrington Signal Co.
Howe Fire Apparatus Co.
Notifier Corp.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Universal Fire Apparatus Corp.
Young Fire Equipment Corp.

Lights
American LaFrance Corp.
Arguslite Co.
Bean, John, Div., Food Machinery & Chemical Corp.
Carpenter Manufacturing Co.
Darley, W. S., & Co.
Federal Sign & Signal Corp.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
Kelco Supply Co.
McDermott, Julian A., Corp.
Macchi & Co. (Flashers for Warning Lights)
North American Signal Co.
Notifier Corp.
Portable Light Co., Inc., The
Safa Alarm Div., Inc., Fyr-Fyter Co., The
U-C Lite Manufacturing Co.
Unity Manufacturing Co.
Universal Fire Apparatus Corp.
Whelen Engineering Co.
Willson Products Div., Ray-O-Vac Co.

Sirens
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Federal Sign & Signal Corp.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
Kelco Supply Co.
Macchi & Co. (Flashers for Sirens)
North American Signal Co.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Sterling Siren Fire Alarm Co., Inc.
Universal Fire Apparatus Corp.

Whistles
Falcon Alarm Co., Inc.
Gamewell Company
Safa Alarm Div., Inc., Fyr-Fyter Co., The

BOATS, FIRE

BOATS
Clayton Skiffs, Inc.
Parkhurst, Richard M.

ENGINES, DIESEL OR GAS
Continental Motors Corp.
Detroit Diesel Engine Div., General Motors Corp.
Hall-Scott (available through Hercules)
Waukesha Motor Company

OUTBOARD MOTORS
Johnson Motors
Pacific Marine Supply Co.

CLOTHING

CLOTHING, PROTECTIVE

Aluminized, Insulated
American LaFrance Corp.
Fyrepel Products, Inc.
Globe Manufacturing Co.
Halprin Supply Co.
Mine Safety Appliances Corp.
Minnesota Mining & Mfg. Co. (Fabrics)
Russell Uniform Co.
Safety Clothing & Equipment Co.

Asbestos
American LaFrance Corp.
Darley, W. S., & Co.
Halprin Supply Co.
Mine Safety Appliances Company
National Trading Co.
Russell Uniform Co.
Safety Clothing & Equipment Co.

Belts
Cairns & Bro., Inc.
Darley, W. S., & Co.
Mine Safety Appliances Company
Russell Uniform Co.
Safety Clothing & Equipment Co.

Boots
American LaFrance Corp.
Beacon Falls Rubber Footwear
Bean, John, Div., Food Machinery & Chemical Corp.
Body Guard Mfg. Co.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Fyrepel Products, Inc.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Co., The
Halprin Supply Co.
Janesville Apparel Co.
Midwestern Safety Mfg. Co.
Russell Uniform Co.

Gloves
American LaFrance Corp.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Fyrepel Products, Inc.
Fyr-Fyter Co., The
Goodrich, B. F., Co., The
Halprin Supply Co.
Mine Safety Appliances Company
Russell Uniform Co.
Safety Clothing & Equipment Co.
Willson Products Div., Ray-O-Vac Co.

Goggles
Cairns & Bro., Inc.
Mine Safety Appliances Co.
Safety Clothing & Equipment Co.
Willson Products Div., Ray-O-Vac Co.

Hats
Bullard, E. D., Co.
Cairns & Bro., Inc.
Fyrepel Products, Inc.
Fyr-Fyter Co., The
Goodall Rubber Co.
Halprin Supply Co.
Midwestern Safety Mfg. Co.
Mine Safety Appliances Co.
Russell Uniform Co.
Reese, S. H.
Safety Clothing & Equipment Co.
Willson Products Div., Ray-O-Vac Co.

Helmets
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Bullard, E. D., Co.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Fyrepel Products, Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Midwestern Safety Mfg. Co.
Mine Safety Appliances Company
Russell Uniform Co.
Safety Clothing & Equipment Co.
Willson Products Div., Ray-O-Vac Co.

Innersoles
American LaFrance Co.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Goodall Rubber Co.
Halprin Supply Co.
Mine Safety Appliances Corp.
Schneck Textile Fibre Co.

Rubber & Canvas
Body Guard Mfg. Co.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co. (canvas)
Globe Manufacturing Co. (canvas)
Goodall Rubber Co.
Goodrich, B. F., Co., The
Halprin Supply Co.
Janesville Apparel Co.
Midwestern Safety Mfg. Co.
Morning Pride Mfg. Co.
Safety Clothing & Equipment Co.

Suits, Quick Hitch
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Fyrepel Products, Inc.
Globe Manufacturing Co.
Halprin Supply Co.
Janesville Apparel Co.
Morning Pride Mfg. Co.
Russell Uniform Co.
Safety Clothing & Equipment Co.

MATERIAL (UNIFORM)
Russell Uniform Co.
Safety Clothing & Equipment Co.

WEARING APPAREL, DRESS

Hats and Caps, Uniform
Cairns & Bro., Inc.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Mine Safety Appliances Company
Reese, S. H.
Russell Uniform Co.
Wentworth-Forman Co., Inc.

Shirts, Uniform
Cairns & Bro., Inc.
Darley, W. S., & Co.
Russell Uniform Co.

Uniforms
Darley, W. S., & Co.
Russell Uniform Co.

Woolen Socks and Mitts
Morning Pride Mfg. Co. (Mitts)

COMMUNICATIONS

ALARM SYSTEMS

Alerting
Du Mont, Allen B., Laboratories, Inc.
Electronic Protection, Inc., Sub. Standard Coil Products Co., Inc.
Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.
Fyr-Fyter Co., The
Gamewell Company
Harrington Signal Co.
North American Signal Co.
Notifier Corp.
Phonalarm Div., Angelus Industries, Inc.
Plectron Corp.
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Automatic
American District Telegraph Co.
Falcon Alarm Co., Inc.
Fyr-Fyter Co., The
Gamewell Company
Halprin Supply Co.
Kidde, Walter, & Co., Inc.
Harrington Signal Co.
North American Signal Co.
Notifier Corp.
Pyrotronics, Div., Baker Industries, Inc.
Safa Alarm Div., Fyr-Fyter Co., The

Batteries
Fyr-Fyter Co., The
Gamewell Company
Harrington Signal Co.
Notifier Corp.
Ray-O-Vac Co.
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Boxes
Federal Sign & Signal Corp.
Fyr-Fyter Co., The
Gamewell Company
Harrington Signal Co.
Notifier Corp.
Phonalarm Div., Angelus Industries, Inc.
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Cable
Fyr-Fyter Co., The
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Central Station
American District Telegraph Co.
American LaFrance Corp.
Federal Sign & Signal Corp.
Fyr-Fyter Co., The
Gamewell Company
Harrington Signal Co.
Notifier Corp.
Phonalarm Div., Angelus Industries, Inc.
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Home
Du Mont, Allen B., Laboratories, Inc.
Falcon Alarm Co., Inc.
Halprin Supply Co.
Industrial Radio Corp.
Kidde, Walter, & Co., Inc.
Notifier Corp.
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Industrial
American District Telegraph Co.
Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.
Fyr-Fyter Co., The
Gamewell Company
Halprin Supply Co.
Harrington Signal Co.
Kidde, Walter, & Co., Inc.
North American Signal Co.
Notifier Corp.
Pacific Marine Supply Co.
Pyrotronics, Div., Baker Industries, Inc.
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Institutional
American District Telegraph Co.
Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.
Fyr-Fyter Co., The
Gamewell Company
Halprin Supply Co.
Kidde, Walter, & Co., Inc.
Notifier Corp.
Pyrotronics Div., Baker Industries, Inc.
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Municipal
American LaFrance Corp.
Electronic Protection, Inc., Sub. Standard Coil Products Co., Inc.
Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.
Fyr-Fyter Co., The
Gamewell Company
Harrington Signal Co.
Notifier Corp.
Phonalarm Div., Angelus Industries, Inc.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Radio
Du Mont, Allen B., Laboratories, Inc.
General Electric Communication Products Dept.
Harron Labs.
Industrial Radio Corp.
Monitoradio Div., I. D. E. A., Inc.
Plectron Corp.
Radio Corp. of America

Recording Systems
Dictaphone Corporation
Fyr-Fyter Co., The
Gamewell Company
Harrington Signal Co.
Notifier Corp.
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Sirens, Air Horns, Whistles & Coders
American LaFrance Corp.
Darley, W. S., & Co.
Falcon Alarm Co., Inc.
Federal Sign & Signal Corp.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Gamewell Company
Halprin Supply Co.
Howe Fire Apparatus Co.
North American Signal Co.
Notifier Corp.
Phonalarm Div., Angelus Industries, Inc.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
Sterling Siren Fire Alarm Co., Inc.

Smoke
American District Telegraph Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Kidde, Walter, & Co., Inc.
Notifier Corp.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Pyrotronics, Div., Baker Industries, Inc.
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Tape Systems
Federal Sign & Signal Corp.
Fyr-Fyter Co., The
Gamewell Company
Graflex, Inc., Sub. General Precision & Equipment Corp.
Harrington Signal Co.
Notifier Corp.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Safa Alarm Div., Inc., Fyr-Fyter Co., The

Watch Tour Systems
Notifier Corp.

LOUD SPEAKERS

Electronic Megaphones
American LaFrance Corp.
Audio Equipment Co., Inc.
Darley, W. S., & Co.
Halprin Supply Co.
Howe Fire Apparatus Co.
Radio Corp. of America
University Loudspeakers Inc.

Public Address Systems
Audio Equipment Co., Inc.
General Electric Communication Products Dept.
Safa Alarm Div., Inc., Fyr-Fyter Co., The
University Loudspeakers Inc.

RADIO

Mobile and Station
Du Mont, Allen B., Laboratories, Inc.
General Electric Communication Products Dept.
Monitoradio Div., I. D. E. A., Inc.
Motorola Communications & Electronics Inc.
Radio Corp. of America

Portable
General Electric Communication Products Dept.
Industrial Radio Corp.
Motorola Communications & Electronics Inc.
Radio Corp. of America

Receivers
Antrex Corp. (Helmet Receivers)
Du Mont, Allen B., Laboratories, Inc.
General Electric Communications Products Dept.
Harron Labs
Industrial Radio Corp.
Monitoradio Div., I. D. E. A., Inc.
Plectron Corp.
Radio Corp. of America

TELEPHONE-EMERGENCY
Gamewell Company
Harrington Signal Co.
Notifier Corp.
Phonalarm Div., Angelus Industries, Inc.

TRAFFIC CONTROL EQUIPMENT

Emergency Radio Control
Darley, W. S., & Co.
Eagle Signal Corp.
Electronic Protection, Inc., Sub. Standard Coil Products Co., Inc.
Falcon Alarm Co., Inc.
General Electric Communication Products Dept.
Kelco Supply Co.

EXTINGUISHERS

EXTINGUISHERS

Carbon Dioxide
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
Kelco Supply Co.
Kidde, Walter, & Co., Inc.
Pacific Marine Supply Co.
Pyrene C-O-Two Div., Fyr-Fyter Co., The
Universal Fire Apparatus Corp.

Chimney Fire
American LaFrance Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Kelco Supply Co.
Pacific Marine Supply Co.

Dry Chemical
American LaFrance Corp.
Ansul Chemical Company
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
Kelco Supply Co.
Kidde, Walter, & Co., Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Safety First Products Corp.
Universal Fire Apparatus Corp.

Foam
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
Kelco Supply Co.
Kidde, Walter, & Co., Inc.
National Foam System, Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Universal Fire Apparatus Corp.

Pressurized Water
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Champion Sprayer Co.
Elkhart Brass Mfg. Co., Inc.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
Kelco Supply Co.
Kidde, Walter, & Co., Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Safety First Products Corp.

Soda & Acid
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
Kelco Supply Co.
Kidde, Walter, & Co., Inc.
National Foam System, Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Universal Fire Apparatus Corp.

Vaporizing Liquid
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Firetox
Halprin Supply Co.
Howe Fire Apparatus Co.
Kelco Supply Co.
Kidde, Walter, & Co., Inc.
National Foam System, Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Universal Fire Apparatus Corp.

Water
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Champion Sprayer Co.
Darley, W. S., & Co.
Deynor Corp.
Elkhart Brass Mfg. Co., Inc.
Fire Fighter Truck Co.

(*Continued on next page*)

Water (Continued)

Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
Kelco Supply Co.
Kidde, Walter, & Co., Inc.
Parco Products Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Smith, D. B., & Co., Inc.
Universal Fire Apparatus Corp.

EXTINGUISHING SYSTEMS

Automatic Sprinkler Supervision

Grinnell Co., Inc.
Notifier Corp.

Carbon Dioxide

American LaFrance Corp.
Fyr-Fyter Co., The
Grinnell Co., Inc.
Kidde, Walter, & Co., Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The

Dry Chemical

Fyr-Fyter Co., The
Grinnell Co., Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The

Foam

American LaFrance Corp.
Fyr-Fyter Co., The
Grinnell Co., Inc.
Halprin Supply Co.
Kidde, Walter, & Co., Inc.
National Foam System, Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The

Water (Sprinkler)

Deynor Corp.
Fyr-Fyter Co., The
Greenberg's, M., Sons
Grinnell Co., Inc.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Sharpsville Steel Fabricators, Inc.

Other

Deynor Corp.
Firetox (Vaporizing Liquid)
Fyr-Fyter Co., The
Notifier Corp.

EXTINGUISHING AGENTS

Foam-Chemical-Liquid

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Darley, W. S., & Co.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
Kidde, Walter, & Co., Inc.
National Foam System, Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Company

Wetting Agents

Akron Brass Mfg. Co., Inc. (Unox)
American LaFrance Corp.
Darley, W. S., & Co.
Deynor Corp.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
National Foam System, Inc.
Rockwood Sprinkler Company

FIRE DEPARTMENT APPLIANCES & SUPPLIES

BADGES, INSIGNIA, ETC.

American LaFrance Corp.
Anson, Inc.
Blackinton, V. H., & Co., Inc.
Braxmar, C. G., Co., Inc., The
Cairns & Bro., Inc.
Darley, W. S., & Co.
Everson-Ross Co., Inc.
Fyr-Fyter Co., The
Gold Crest Safety Equipment Corp.
Halprin Supply Co.
Nielsen-Rioada, Inc.
Reese, S. H.
Russell Uniform Co.
Wentworth-Forman Co., Inc.

BLANKETS, FIRE

American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fyrepel Products, Inc. (Aluminized, Insulated)
Fyr-Fyter Co., The
Halprin Supply Co.
Mine Safety Appliances Company
Safety Clothing & Equipment Co.

BROOMS, FIRE FIGHTING

American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Brooklyn Fibre Broom Co., Inc.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
Perfex

BROOMS, SAFETY, NON SPARKING

Brooklyn Fibre Broom Co., Inc.
Perfex

EJECTORS AND EXHAUSTERS, SMOKE

American LaFrance Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Homelite Div., Textron, Inc.
Mountain States Equipment Co.
Super Vacuum Mfg Co., Inc.
Wooster Brass Div., Fyr-Fyter Co., The

FOAM GENERATORS OR PUMPS

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Hale Fire Pump Co.
Halprin Supply Co.
National Foam System, Inc.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Young Fire Equipment Corp.

FUND RAISING DEVICES

Coin Savers
Hanford-Brown Co.

GAS DETECTORS

Mine Safety Appliances Corp.

GAUGES

Compound

American LaFrance Corp.
Darley, W. S., & Co.
Halprin Supply Co.
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

Piezometers

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Halprin Supply Co.
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

Pressure

Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

Testing

Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

GENERAL FIRE DEPT. SUPPLIES

Cairns & Bro., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Oren Roanoke Corp.

LADDERS

Fiberglass

Aluminum Ladder Co.

Metal

Aluminum Ladder Co. (Aluminum)
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Duo-Safety Ladder Corp.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
Pirsch, Peter, & Sons Co. (Aluminum)
Sharpsville Steel Fabricators, Inc.
Uddstrom, P. R., Co.
Universal Fire Apparatus Corp.

Rope

Fyr-Fyter Co., The
Halprin Supply Co.

Wood

American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Duo-Safety Ladder Corp.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
Maxim Motor Co.
Pirsch, Peter, & Sons Co.
Seagrave Corporation
Sharpsville Steel Fabricators, Inc.
Stephenson Corporation
Universal Fire Apparatus Corp.

LIFE BELTS

American LaFrance Corp.
Atlas Safety Equipment Co., Inc.
Darley, W. S., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Wooster Brass Div., Fyr-Fyter Co., The

LIFE GUNS

American LaFrance Corp.
Darley, W. S., & Co.
Halprin Supply Co.
Naval Co.
Pacific Marine Supply Co.
Superior Signal Co., Inc.

NETS, LIFE AND TRAINING

American LaFrance Corp.
Atlas Safety Equipment Company, Inc.
Darley, W. S., & Co.
Halprin Supply Co.

PHOTOGRAPHIC EQUIPMENT

Graflex, Inc., Sub. General Precision & Equipment Corp.

PROPORTIONERS AND EDUCTORS, WET WATER & FOAM

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Deynor Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Hale Fire Pump Co. (Foam)
Halprin Supply Co.
Howe Fire Apparatus Co.
National Foam System, Inc.
Rockwood Sprinkler Company

RECORD BOOKS, DEPARTMENT

Cairns & Bro., Inc.

RUST PREVENTATIVES

Halprin Supply Co.

SALVAGE COVERS

American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Fyrepel Products, Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Hoosier Tarpaulin & Canvas Goods Co., Inc. (Nylon or Canvas)
Safety Clothing & Equipment Co.

SEARCH AND RESCUE EQUIPMENT

American LaFrance Corp.
Aquatic Equipment Co.
Blackhawk Mfg. Co. (Rescue)
Bomgardner Mfg. Co., The
Gold Crest Safety Equipment Corp.
Fyr-Fyter Co., The
Halprin Supply Co.
Hein-Werner Corp.
Kelco Supply Co.
Porter, H. K., Inc.

SLIDING POLES, FIRE STATION

Greenberg's, M., Sons
McIntire, F. N., Brass Works, Inc.

SMOKE & ODOR REMOVERS
Mountain States Equipment Co.
Super Vacuum Mfg. Co., Inc.

SMOKE BOMBS
Halprin Supply Co.
Superior Signal Co., Inc.

THAWING EQUIPMENT, HYDRANT
American LaFrance Corp.
Darley, W. S., & Co.
Universal Fire Apparatus Corp.

THREAD CUTTING EQUIPMENT
American LaFrance Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Halprin Supply Corp.
Wooster Brass Div., Fyr-Fyter Co., The

TRAINING AIDS
Delehanty Correspondence School

TROPHIES & PLAQUES
Blackinton, V. H., & Co., Inc.
Cairns & Bro., Inc.
Gold Crest Safety Equipment Corp.
Greenberg's, M., Sons
National Trophy Sales, Inc.

VENTILATING EQUIPMENT
Super Vacuum Mfg. Co., Inc.

WATER TANKS, PORTABLE CANVAS
American LaFrance Corp.
Darley, W. S., & Co.
Fol-Da-Tank Co.
Halprin Supply Co.
Hoosier Tarpaulin & Canvas Goods Co., Inc.
Howe Fire Apparatus Co.
Pacific Marine Supply Co.

FIRE PREVENTION

FIRE RETARDANT MATERIALS

Paint, Etc.
Gold Crest Safety Equipment Corp.
Notifier Corp.

Safety Equipment for Flammable Liquids
Darley, W. S., & Co.
Firetox
Fyr-Fyter Co., The
Halprin Supply Co.
Safety Clothing & Equipment Co.

FIRST AID EQUIPMENT

AMBULANCE COTS
Ambulitter Corp.
Bomgardner Mfg. Co., The
Ferno Mfg. Co.
Gold Crest Safety Equipment Corp.
Halprin Supply Co.
Kelco Supply Co.
Mine Safety Appliances Co.
National Coaches, Inc.
Sharpsville Steel Fabricators, Inc.
Superior Coach Corp.
Washington Products Co.

BURN TREATMENT
Bullard, E. D., Co.
Fyr-Fyter Co., The
Gold Crest Safety Equipment Corp.
Halprin Supply Co.
Kelco Supply Co.
McCann Products Co.
Medical Supply Co.
Mine Safety Appliances Co.
Safety Clothing & Equipment Co.

FIRST AID KITS
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Bullard, E. D., Co.
Fyr-Fyter Co., The
Gold Crest Safety Equipment Corp.
Halprin Supply Co.
Kelco Supply Co.
Medical Supply Co.
Mine Safety Appliances Co.

PROTECTIVE BREATHING & REVIVING APPARATUS

Air Breathing Equipment
Acme Protection Equipment Co.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Bomgardner Mfg. Co., The
Cornelius Co., The
Darley, W. S., & Co.
Fyrepel Products, Inc.
Fyr-Fyter Co., The, Fyr-Fyter Div.
Globe Industries, Inc., Medical & Hospital Dept.
Halprin Supply Co.
Kelco Supply Co.
Mine Safety Appliances Co.
National Coaches, Inc.
Scott Aviation Corp.
Stephenson Corporation

Air Compressors
Cornelius Co., The

Aspirators
Bean, John, Div., Food Machinery & Chemical Corp.
Bomgardner Mfg. Co., The
Darley, W. S., & Co.
E & J Manufacturing Company
Emerson, J. H., Co.
Fyr-Fyter Co., The
Globe Industries, Inc., Medical & Hospital Dept.
Halprin Supply Co.
Kelco Supply Co.
Midwest Oxygen Equipment Co.
Mine Safety Appliances Co.
Oxygen Equipment & Service Co.

Inhalators
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Bomgardner Mfg. Co., The
Darley, W. S., & Co.
E & J Manufacturing Company
Emerson, J. H., Co.
Fyr-Fyter Co., The
Globe Industries, Inc., Medical & Hospital Dept.
Halprin Supply Co.
Kelco Supply Co.
Midwest Oxygen Equipment Co.
Mine Safety Appliances Co.
National Coaches, Inc.
Oxygen Equipment & Service Co.
Scott Aviation Corp.
Stephenson Corporation

Masks
Acme Protection Equipment Co.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
E & J Manufacturing Company
Fyr-Fyter Co., The
Globe Industries, Inc., Medical & Hospital Dept.
Halprin Supply Co.
Kelco Supply Co.
Midwest Oxygen Equipment Co.
Mine Safety Appliances Co.
Oxygen Equipment & Service Co.
Scott Aviation Corp.
Willson Products Div., Ray-O-Vac Co.

Oxygen Breathing Equipment
Acme Protection Equipment Co.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Bomgardner Mfg. Co., The
Bullard, E. D., Co.
Darley, W. S., & Co.
E & J Manufacturing Company
Fyrepel Products, Inc.
Fyr-Fyter Co., The
Globe Industries, Inc., Medical & Hospital Dept.
Gold Crest Safety Equipment Corp.
Halprin Supply Co.
Kelco Supply Co.
Mine Safety Appliances Co.
Oxygen Equipment & Service Co.
Stephenson Corporation

Respirators
Bean, John, Div., Food Machinery & Chemical Corp.
Bomgardner Mfg. Co., The
Darley, W. S., & Co.
E & J Manufacturing Company
Emerson, J. H., Co.
Fyr-Fyter Co., The
Globe Industries, Inc., Medical & Hospital Dept.
Halprin Supply Co.
Kelco Supply Co.
Mine Safety Appliances Company
Oxygen Equipment & Service Co.
Safety Clothing & Equipment Co.
Scott Aviation Corp.
Willson Products Div., Ray-O-Vac Co.

Resuscitators
American LaFrance Corp.
Batrow Laboratories, Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Bomgardner Mfg. Co., The
Darley, W. S., & Co.
E & J Manufacturing Company
Emerson, J. H., Co.
Fyr-Fyter Co., The
Globe Industries, Inc., Medical & Hospital Dept.
Gold Crest Safety Equipment Corp.
Halprin Supply Co.
Howe Fire Apparatus Co.
Kelco Supply Co.
Medical Supply Co.
Midwest Oxygen Equipment Co.
Mine Safety Appliances Co.
National Coaches, Inc.
Oxygen Equipment & Service Co.
Stephenson Corporation

SPLINTS
Gold Crest Safety Equipment Corp.
Kelco Supply Co.
Medical Supply Co.
Mine Safety Appliances Co.

STRETCHERS
Ambulitter Corp.
American LaFrance Corp.
Bomgardner Mfg. Co., The
Bullard, E. D., Co.
Darley, W. S., & Co.
Ferno Mfg. Co.
Gold Crest Safety Equipment Corp.
Halprin Supply Co.
Kelco Supply Co.
Medical Supply Co.
Mine Safety Appliances Co.
National Coaches, Inc.
Safety Clothing & Equipment Co.
Washington Products Co.

HOSE, HOSE FITTINGS & HOSE STREAM APPLIANCES

HOSE, CHEMICAL & BOOSTER
American LaFrance Corp.
American Rubber Mfg. Co., The
Bean, John, Div., Food Machinery & Chemical Corp.
Bi-Lateral Fire Hose Co.
Boston Woven Hose & Rubber Co., Div. American Biltrite Rubber Co., Inc.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Fabric Fire Hose Co.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Co., The
Halprin Supply Co.
Hamilton Rubber Mfg. Corp.
Hewitt-Robins, Inc.
Howe Fire Apparatus Co.
Pacific Marine Supply Co.
Quaker Rubber Div., H. K. Porter Co., Inc.
Republic Rubber Division, Lee Rubber & Tire Corp.
United States Rubber Co.
Universal Fire Apparatus Corp.

HOSE COTTON, R. L.
American LaFrance Corp.
American Rubber Mfg. Co., The
Bean, John, Div., Food Machinery & Chemical Corp.
Bi-Lateral Fire Hose Co.
Boston Woven Hose & Rubber Co., Div. American Biltrite Rubber Co., Inc.
Fabric Fire Hose Co.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Co., The
Halprin Supply Co.
Hamilton Rubber Mfg. Corp.
Hewitt-Robins, Inc.
Howe Fire Apparatus Co.
National Foam System, Inc.
Pacific Marine Supply Co.
Quaker Rubber Div., H. K. Porter Co., Inc.
Republic Rubber Div., Lee Rubber & Tire Corp.

HOSE FORESTRY
American Rubber Mfg. Co., The
Bi-Lateral Fire Hose Co.
Boston Woven Hose & Rubber Co., Div., American Biltrite Rubber Co., The
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Fabric Fire Hose Co.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Co., The
Halprin Supply Co.
Hamilton Rubber Mfg. Corp.
Hewitt-Robins, Inc.
Pacific Marine Supply Co.
Quaker Rubber Div., H. K. Porter Co., Inc.
Republic Rubber Division, Lee Rubber & Tire Corp.

HOSE, HIGH PRESSURE

American LaFrance Corp.
American Rubber Mfg. Co., The
Bean, John, Div., Food Machinery & Chemical Corp.
Bi-Lateral Fire Hose Co.
Boston Woven Hose & Rubber Co., Div., American Biltrite Rubber Co., Inc.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Fabric Fire Hose Co.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Co., The
Halprin Supply Co.
Hamilton Rubber Mfg. Co.
Hewitt-Robins, Inc.
Howe Fire Apparatus Co.
Pacific Marine Supply Co.
Quaker Rubber Div., H. K. Porter Co., Inc.
Republic Rubber Division, Lee Rubber & Tire Corp.
United States Rubber Co.
Universal Fire Apparatus Corp.

HOSE, RUBBER LINED

American LaFrance Corp.
American Rubber Mfg. Co., The
Bean, John, Div., Food Machinery & Chemical Corp.
Bi-Lateral Fire Hose Co.
Boston Woven Hose & Rubber Co., Div., American Biltrite Rubber Co., Inc.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Fabric Fire Hose Co.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Co., The
Halprin Supply Co.
Hamilton Rubber Mfg. Corp.
Hewitt-Robins Inc.
Howe Fire Apparatus Co.
National Foam System, Inc.
Pacific Marine Supply Co.
Quaker Rubber Div., H. K. Porter Co., Inc.
Republic Rubber Division, Lee Rubber & Tire Corp.
United States Rubber Co.

HOSE SUCTION

American LaFrance Corp.
American Rubber Mfg. Co., The
Bean, John, Div., Food Machinery & Chemical Corp.
Bi-Lateral Fire Hose Co.
Boston Woven Hose & Rubber Co., Div., American Biltrite Rubber Co., Inc.
Darley, W. S., & Co.
Eureka Fire Hose Div., U. S. Rubber Co.
Fabric Fire Hose Co.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Co., The
Halprin Supply Co.
Hamilton Rubber Mfg. Corp.
Hewitt-Robins Inc.
Howe Fire Apparatus Co.
Pacific Marine Supply Co.
Quaker Rubber Div., H. K. Porter Co., Inc.
Republic Rubber Division, Lee Rubber & Tire Corp.
United States Rubber Co.
Universal Fire Apparatus Corp.

HOSE APPLIANCES

Holders

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Boston Coupling Co.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
H. & H. Fire Apparatus, Inc.
Halprin Supply Co.
Wooster Brass Div., Fyr-Fyter Co., The

Hydrant Gates

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Boston Coupling Co.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons
H. & H. Fire Apparatus, Inc.
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Mueller Co.
Powhatan Brass & Iron Works
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

Increasers and Reducers

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Boston Coupling Co.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons
H. & H. Fire Apparatus, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

Siamese and Y-fittings

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Boston Coupling Co.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons
Grinnell Co., Inc.
H. & H. Fire Apparatus, Inc.
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

Siphons

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons
Halprin Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The

Suction Strainers

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Bean, John, Div. Food Machinery & Chemical Corp.
Boston Coupling Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fol-Da-Tank Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons
H. & H. Fire Apparatus, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Wooster Brass Div., Fyr-Fyter Co., The

Swivel Joints

Akron Brass Mfg. Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Eastman, Samuel, Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons
H. & H. Fire Apparatus, Inc.
Halprin Supply Co.

HOSE BRIDGES

American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Consolidated Welding & Engineering, Inc.
Darley, W. S., & Co.
Fyr-Fyter Co., The
H. & H. Fire Apparatus, Inc.
Halprin Supply Co.
Quaker Rubber Div., H. K. Porter, Inc.
Sharpsville Steel Fabricators, Inc.

HOSE CABINET UNITS

American Rubber Mfg. Co., The
Circul-Air Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
H. & H. Fire Apparatus, Inc.
Halprin Supply Co.
Howe Fire Apparatus Co.
Pacific Marine Supply Co.

HOSE CARTS, RACKS

American LaFrance Corp.
American Rubber Mfg. Co., The
Darley, W. S., & Co.
Circul-Air Corp.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
H. & H. Fire Apparatus, Inc.
Halprin Supply Co.
Pacific Marine Supply Co.

HOSE CLAMPS

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Hewitt-Robins, Inc.
Hydra-Clamp Co.
Kellam Mfg. Co.
Pacific Marine Supply Co.
Pirsch, Peter, & Sons Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Wooster Brass Div., Fyr-Fyter Co., The

HOSE CLEANER

American LaFrance Corp.
Bi-Lateral Fire Hose Co.
Halprin Supply Co.

HOSE COUPLING EXPANDERS

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

HOSE COUPLING EXPANSION RINGS

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
American Rubber Mfg. Co., The
Boston Coupling Co.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fabric Fire Hose Co.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Co., The
Greenberg's, M., Sons
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

HOSE COUPLINGS, ADAPTERS, WRENCHES

Akron Brass Mfg. Co., Inc.
Allway Coupling Co.
American LaFrance Corp.
American Rubber Mfg. Co., The
Bar-Way Manufacturing Co. (Couplings, High Pressure)
Bean, John, Div., Food Machinery & Chemical Corp.
Boston Coupling Co.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fabric Fire Hose Co.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Co., The
Greenberg's, M., Sons
Halprin Supply Co.
Hewitt-Robins, Inc.
McIntire, F. N., Brass Works, Inc.
Mueller Co.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Wooster Brass Div., Fyr-Fyter Co., The

HOSE DRYERS

American LaFrance Corp.
Circul-Air Corporation
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.

HOSE FIBRE, POLYESTER

American LaFrance Corp.
Du Pont de Nemours, E. I. & Co., Inc.
Fyr-Fyter Co., The
Goodall Rubber Co.
Goodrich, B. F., Co., The

HOSE INCREASERS AND REDUCERS

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.

Boston Coupling Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons
Halprin Supply Co.
Howe Fire Apparatus Co.
Pacific Marine Supply Co.
Wooster Brass Div., Fyr-Fyter Co., The

HOSE JACKETS

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
American Rubber Mfg. Co., The
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyrepel Products, Inc. (Heat Protective)
Fyr-Fyter Co., The
Goodrich, B. F., Co., The
Halprin Supply Co.
Hewitt-Robins, Inc.
Pacific Marine Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Quaker Rubber Div., H. K. Porter, Inc.
Republic Rubber Div., Lee Rubber & Tire Corporation
Wooster Brass Div., Fyr-Fyter Co., The

HOSE REELS

American LaFrance Corp.
American Rubber Mfg. Co., The
Ardmore Products
Bean, John, Div., Food Machinery & Chemical Corp.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
H. & H. Fire Apparatus, Inc.
Halprin Supply Co.
Hannay, Clifford B., & Son, Inc.
Howe Fire Apparatus Co.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works

HOSE STORAGE RACKS

American LaFrance Corp.
Circul-Air Corp.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Hannay, Clifford B., & Son, Inc.
W-B Manufacturing Co.

HOSE TURN TABLES

American LaFrance Corp.
Circul-Air Corp.
Fyr-Fyter Co., The
Halprin Supply Co.

HOSE WASHERS

American LaFrance Corp.
American Rubber Mfg. Co., The
Circul-Air Corp.
Goodrich, B. F., Co., The
Halprin Supply Co.
Quaker Rubber Div., H. K. Porter, Inc.

HYDRANT WRENCHES

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Boston Coupling Co.
Burns Tool Co.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Mueller Co.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
S-T Hydrant Wrench Co. (Rachet)
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

HYDRANTS

Greenberg's, M., Sons
Keystone Valve Corp.
Mueller Co.
Ross Valve Mfg. Co., Inc.
Universal Fire Apparatus Corp.
Waterous Company
Wooster Brass Div., Fyr-Fyter Co., The

NOZZLES

Cellar Pipe

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Baker, J. M., Pattern Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Company
Wooster Brass Div., Fyr-Fyter Co., The

Deck Guns

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Baker, J. M., Pattern Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Rockwood Sprinkler Co.
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

Deluge Sets

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Baker, J. M., Pattern Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons
Halprin Supply Co.
Howe Fire Apparatus Co.
McIntire, F. N., Brass Works, Inc.
Rockwood Sprinkler Co.
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

Distributor

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Ansul Chemical Company
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

Foam

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Halprin Supply Co.
National Foam System, Inc.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Company
Wooster Brass Div., Fyr-Fyter Co., The

Fog

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Baker, J. M., Pattern Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Co.
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

Fog Foam

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Baker, J. M., Pattern Co., Inc.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Company
Wooster Brass Div., Fyr-Fyter Co., The

Fog High Pressure

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Baker, J. M., Pattern Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp. (gun type)
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
McIntire, F. N., Brass Works, Inc.
Myers, F. E., & Bro., Co.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Co.
Universal Fire Apparatus Corp.

Master Stream

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

Partition

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons
Halprin Supply Co.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Wooster Brass Div., Fyr-Fyter Co., The

Pipes, Ladder

Akron Brass Mfg. Co., Inc. (also automatic)
American LaFrance Corp.
Baker, J. M., Pattern Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc. (also automatic)
Fyr-Fyter Co., The
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

Pipes, Play

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Baker, J. M., Pattern Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Powhatan Brass & Iron Works
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

Shut-Off

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Ansul Chemical Company
Baker, J. M., Pattern Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons
Halprin Supply Co.
Howe Fire Apparatus Co.
McIntire, F. N., Brass Works, Inc.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Pyrene-C-O-Two Div., Fyr-Fyter Co., The
Rockwood Sprinkler Company
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

Turrets, Mechanically Operated
Akron Brass Mfg. Co., Inc.

VALVES

Hose
Akron Brass Mfg. Co., Inc.
Bean, John, Div., Food Machinery & Chemical Corp.
Boston Coupling Co.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons
Grinnell Co., Inc.
Hale Fire Pump Co.
Halprin Supply Co.
McIntire, F. N., Brass Works, Inc.
Mueller Co.
Pacific Marine Supply Co.
Powhatan Brass & Iron Works
Rockwood Sprinkler Company
Ross Valve Mfg. Co., Inc.
Waterous Company
Wooster Brass Div., Fyr-Fyter Co., The
Young Fire Equipment Corp.

Hydrant-Gates
Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Boston Coupling Co.
Darley, W. S., & Co.
Eastman, Samuel, Co., Inc.
Elkhart Brass Mfg. Co., Inc.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Greenberg's, M., Sons
Grinnell Co., Inc.
Halprin Supply Co.
Keystone Valve Corp.
McIntire, F. N., Brass Works, Inc.
Mueller Co.
Powhatan Brass & Iron Works
Waterous Company
Wooster Brass Div., Fyr-Fyter Co., The

Relief
Akron Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Greenberg's, M., Sons
Hale Fire Pump Co.
High Fog Pump Co.
Howe Fire Apparatus Co.
Mueller Co.
Pacific Marine Supply Co.
Ross Valve Mfg. Co., Inc.
Universal Fire Apparatus Corp.
Waterous Company
Wooster Brass Div., Fyr-Fyter Co., The

LIGHTING AND LIGHTING EQUIPMENT

BATTERIES, FLASHLIGHT
Arguslite Co.
Halprin Supply Co.
Kelco Supply Co.
Koehler Mfg. Co.
Pacific Marine Supply Co.
Ray-O-Vac Co.

BATTERY CHARGERS
American LaFrance Corp.
Carpenter Manufacturing Co.
Halprin Supply Co.
Harrington Signal Co.
Koehler Mfg. Co.
Onan, D. W., & Sons, Inc.
Pioneer Gen-E-Motor Corp.

LIGHTS

Emergency (Automatic)
American LaFrance Corp.
Carpenter Manufacturing Co.
Kelco Supply Co.
Halprin Supply Co.
Howe Fire Apparatus Co.
Pioneer Gen-E-Motor Corp.
U-C Lite Manufacturing Co.

Flares
Arguslite Co.
Darley, W. S., & Co.
Halprin Supply Co.
McDermott, Julian A., Corp.
U-C Lite Manufacturing Co.

Floodlights
American LaFrance Corp.
Arguslite Co.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Halprin Supply Co.
Homelite Div., Textron Inc.
Howe Fire Apparatus Co.
McDermott, Julian A., Corp.
Natale Machine & Tool Co.
Pacific Marine Supply Co.
U-C Lite Manufacturing Co.
Unity Manufacturing Co.

Hand Lamps
American LaFrance Corp.
Arguslite Co.
Bean, John, Div., Food Machinery & Chemical Corp.
Carpenter Manufacturing Co.
Darley, W. S., & Co.
Fairbanks, Morse & Co.
Halprin Supply Co.
Kelco Supply Co.
Koehler Manufacturing Co.
McDermott, Julian A., Corp.
Mine Safety Appliances Co.
Natale Machine & Tool Co.
Ray-O-Vac Co.
U-C Lite Manufacturing Co.
Unity Manufacturing Co.
Universal Fire Apparatus Corp.

Searchlights
American LaFrance Corp.
Arguslite Co.
Bean, John, Div., Food Machinery & Chemical Corp.
Carpenter Manufacturing Co.
Darley, W. S., & Co.
Halprin Supply Co.
Howe Fire Apparatus Co.
McDermott, Julian A., Corp.
Natale Machine & Tool Co.
Pacific Marine Supply Co.
Unity Manufacturing Co.
Universal Fire Apparatus Corp.

LIGHTING PLANTS, EMERGENCY

Portable
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Cairns & Bro., Inc.
Detroit Diesel Engine Div., General Motors Corp.
Halprin Supply Co.
Homelite Div., Textron, Inc.
Howe Fire Apparatus Co.
Koehler Mfg. Co.
Kohler Co.
Onan, D. W., & Sons, Inc.
Pacific Marine Supply Co.
Pioneer Gen-E-Motor Corp.
Wincharger Corp.

Stationary
American LaFrance Corp.
Detroit Diesel Engine Div., General Motors Corp.
Kohler Co.
Onan, D. W., & Sons, Inc.
Pacific Marine Supply Co.
Pioneer Gen-E-Motor Corp.
Wincharger Corp.

PUMPS

PUMPS

Fire Apparatus
American LaFrance Corp.
American Fire Pump Co.
Darley, W. S., & Co.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Gorman-Rupp Co.
Hale Fire Pump Co.
Halprin Supply Co.
Howe Fire Apparatus Co.
Oberdorfer Foundries, Inc.
Oren Roanoke Corp.
Pacific Marine Supply Co.
Seagrave Corporation
Sharpsville Steel Fabricators, Inc.
Universal Fire Apparatus Corp.
Waterous Company
Young Fire Equipment Corp.

Hand Pumps
Darley, W. S., & Co.
Halprin Supply Co.
Myers, F. E., & Bro. Co.
Oberdorfer Foundries, Inc.
Parco Products Co.
Smith, D. B., & Co., Inc.

High Pressure
American LaFrance Corp.
American Fire Pump Co.
Darley, W. S., & Co.
Fairbanks, Morse & Co.
Fire Fighter Truck Co.
Gorman-Rupp Co.
Hale Fire Pump Company
Halprin Supply Co.
High Fog Pump Co.
Howe Fire Apparatus Co.
Marine Products Company
Myers, F. E., & Bro., Co.
Oren Roanoke Corp.
Pacific Marine Supply Co.
Seagrave Corporation
Sharpsville Steel Fabricators, Inc.
Waterous Company
Young Fire Equipment Corp.

Hydrant Dewatering
Akron Brass Mfg. Co., Inc.
Darley, W. S., & Co.
Fairbanks, Morse & Co.
Gorman-Rupp Co.
Halprin Supply Co.
Marine Products Company
Oberdorfer Foundries, Inc.
Wooster Brass Div., Fyr-Fyter Co., The

Portable
American LaFrance Corp.
American Fire Pump Co.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Fairbanks, Morse & Co.
Fire Fighter Truck Co.
Fyr-Fyter Co., The
Gorman-Rupp Co.
Hale Fire Pump Co.
Halprin Supply Co.
Homelite Div., Textron, Inc.
Howe Fire Apparatus Co.
Marine Products Company
Marlow Pumps Div., Bell & Gossett Co.
Oberdorfer Foundries, Inc.
Oren Roanoke Corp.
Pacific Marine Supply Co.
Parco Products Co. (Knapsack)
Sharpsville Steel Fabricators, Inc.
Smith, D. B., & Co., Inc.
Universal Fire Apparatus Corp.
Young Fire Equipment Corp.

Suction Boosters
American Fire Pump Co.
Darley, W. S., & Co.
Halprin Supply Co.
Marine Products Co.
Potter-Horn, Inc.
Oberdorfer Foundries, Inc.

Trailer Mounted
American LaFrance Corp.
Darley, W. S., & Co.
Fairbanks, Morse & Co.
Gorman-Rupp Co.
Hale Fire Pump Co.
Halprin Supply Co.
Maxim Motor Co.
National Foam System, Inc.
Oberdorfer Foundries, Inc.
Universal Fire Apparatus Corp.
Waterous Company

TOOLS

AXES
American LaFrance Corp.
Atlas Safety Equipment Co., Inc. (Insulated)
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Mann Edge Tool Company
Universal Fire Apparatus Corp.

CUTTERS, BAR, CHAIN, WIRE
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halprin Supply Co.
Porter, H. K., Inc.

CUTTING & WELDING EQUIPMENT
American LaFrance Corp.
Darley, W. S., & Co.
Fyr-Fyter Co., The
Gas Arc Supply Co.
Halprin Supply Co.
Welders Service, Inc. (Packo Emergency)

FORCIBLE ENTRY TOOLS

American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
C.-D. Pike & Fire Hook Mfg. Corp.
Darley, W. S., & Co.
Elkhart Brass Mfg. Co., Inc.
Fyr-Fyter Co., The
Halligan Tool Co.
Halprin Supply Co.
Howe Fire Apparatus Co.
Milwaukee Electric Tool Corp.
Pirsch, Peter, & Sons, Co.
Porter, H. K., Co.
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

HOOK & PIKE POLES

Akron Brass Mfg. Co., Inc.
American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
C-D Pike & Fire Hook Mfg. Co.
Darley, W. S., & Co.
Duo-Safety Ladder Corp.
Fyr-Fyter Co., The
Halprin Supply Co.
Howe Fire Apparatus Co.
Pacific Marine Supply Co.
Universal Fire Apparatus Corp.
Wooster Brass Div., Fyr-Fyter Co., The

HOT LINE HANDLING TOOLS

Bean, John, Div., Food Machinery & Chemical Corp.
Halprin Supply Co.
Porter, H. K., Inc.

JACKS (Hydraulic)

Bean, John, Div., Food Machinery & Chemical Corp.
Blackhawk Mfg. Co.
Halprin Supply Co.
Hein-Werner Corp.
Porter, H. K., Inc.

POWER PLANTS, ELECTRIC

Portable

American LaFrance Corp.
Bean, John, Div., Food Machinery & Chemical Corp.
Cairns & Bro., Inc.
Darley, W. S., & Co.
Fairbanks, Morse & Co.
Halprin Supply Co.
Homelite Div., Textron, Inc.
Howe Fire Apparatus Co.
Kohler Co.
Milwaukee Electric Tool Corp., (Electric)
Onan, D. W., & Sons, Inc.
Pacific Marine Supply Co.
Pioneer Gen-E-Motor Corp.
Wincharger Corp.
Winpower Mfg. Co.

Stationary

American LaFrance Corp.
Halprin Supply Co.
Kohler Co.
Onan, D. W., & Sons, Inc.
Pacific Marine Supply Co.
Pioneer Gen-E-Motor Corp.
Wincharger Corp.
Winpower Mfg. Co.

POWER TOOLS

Fyr-Fyter Co., The
Halprin Supply Co.
Homelite Div., Textron, Inc.
Milwaukee Electric Tool Corp.
Pacific Marine Supply Co.
Pioneer Gen-E-Motor Corp.

RESCUE TOOLS, HYDRAULIC

American LaFrance Corp.
Blackhawk Mfg. Co.
Fyr-Fyter Co., The
Halprin Supply Co.
Hein-Werner Corp.
Kelco Supply Co.
Porter, H. K., Inc.

SAWS, CHAIN

Halprin Supply Co.
Homelite Div., Textron, Inc.
Milwaukee Electric Tool Corp., (Electric)
Pacific Marine Supply Co.

TOOLS, GENERAL PURPOSE

Burns Tool Co.

DIRECTORY OF MANUFACTURERS

Listed in WHERE TO BUY SECTION

For Advertisers in this issue see Advertising Index on page 816

Acme Protection Equipment Co., 1215 Kalamazoo St., South Haven, Mich.
Akron Brass Mfg. Co., Inc., 1500 Spruce St., Wooster, Ohio
Allway Coupling Co., P. O. Box 2181, Grand Central Station, New York 17, N. Y.
Aluminum Ladder Co., Worthington 8, Pa.
Ambulitter Corp., Chestertown, Md.
American District Telegraph Co., 155 Sixth Ave., New York 13, N. Y.
American Fire Apparatus Co., Box 1024, Battle Creek, Mich.
American Fire Pump Co., Capital Ave., Battle Creek, Mich.
American LaFrance Corp., 100 E. LaFrance St., Elmira, N. Y.
American Rubber Mfg. Co., 1145 Park Ave., Oakland 8, Cal.
Anson, Inc., 24 Baker St., Providence, R. I.
Ansul Chemical Co., 1 Stanton St., Marinette, Wis.
Antrex Corp., 854 N. Rockwell St., Chicago, Ill.
Approved Fire Equipment Co., Inc., Austin & Audubon Blvds., Island Park, L. I., N. Y.
Aquatic Equipment Co., Box 14, Forest City, Iowa
Ardmore Products, 1825 Shermer Rd., Northbrook, Ill.
Argulite Co., Blue Ridge Summit, Pa.
Atlas Safety Equipment Co., Inc., 173-179 N. 10th St., Brooklyn 11, N. Y.
Audio Equipment Co., Inc., 75 Harbor Road, Port Washington, N. Y.

B & C Products Co., 2227 Wilson St., N. E., Minneapolis 18, Minn.
Baker, J. M., Pattern Co., Inc., 68 Sprague St., Providence 7, R. I.
Bar-Way Mfg. Co., 60 Canal St., Stamford, Conn.
Batrow Laboratories, Inc., Branford, Conn.
Beacon Falls Rubber Footwear, Beacon Falls, Conn.
Bean, John, Div., Food Machinery and Chemical Corp., 1305 S. Cedar St., Lansing 4, Mich.
Bi-Lateral Fire Hose Co., 20 N. Wacker Dr., Chicago 6, Ill.
Blackhawk Mfg. Co., 5325 W. Rogers St., Milwaukee 46, Wis.
Blackinton, V. H., & Co., Inc., 140 Commonwealth Ave., Attleboro Falls, Mass.
Boardman Co., Fire Apparatus Div., 1401 S. W. 11th St., P. O. Box 1152, Oklahoma City 1, Okla.
Body-Guard Mfg. Co., 222 S. Fourth St., St. Joseph, Mo.
Bomgardner Mfg. Co., The, 1384 Hird Ave., Cleveland 7, Ohio
Boston Coupling Co., 293 Congress St., Boston, Mass.
Boston Woven Hose & Rubber Co., Div. American Biltrite Rubber Co., Inc., P. O. Box 1071, Boston 3, Mass.
Braxmar, C. C., Co., Inc., 216 E. 45th St., New York 17, N. Y.
Brooklyn Fibre Broom Co., Inc., 41 Dinsmore Place, Brooklyn 8, N. Y.
Bullard, E. D., Co., 2680 Bridgeway, Sausalito, Cal.
Burns Tool Co., 1526 Lucia Ave., Waukegan, Ill.

Cairns & Bro., Inc., 854 Bloomfield Ave., Allwood, Clifton, N. J.
Carpenter Mfg. Co., Master Light Building, Boston 45, Somerville, Mass.
C-D Pike & Fire Hook Mfg. Corp., 207 Orange St., New Haven 10, Conn.
Champion Sprayer Co., 6553 Heintz Ave., Detroit 11, Mich.
Christopher Co., The, 66-70 Beaver St., New York 4, N. Y.
Circul-Air Corp., 575 E. Milwaukee Ave., Detroit 2, Mich.
Clayton Skiffs, Inc., Fischer Blvd., Toms River, N. J.
Coin Savers, New Cumberland, Pa.
Consolidated Welding & Engineering, Inc., 34 French St., Methuen, Mass.
Continental Motors Corp., 205 Market St., Muskegon, Mich.
Cornelius Company, The, 550—39th Ave., N. E., Minneapolis 21, Minn.

Darley, W. S., & Co., 2810 Washington Blvd., Chicago 12, Ill.
Delco-Remy Div., General Motors Corp., 2401 Columbus Ave., Anderson, Ind.
Delehanty Correspondence School, 115 E. 15th St., New York, N. Y.
Detroit Diesel Engine Div., General Motors Corp., 13400 W. Outer Dr., Detroit 28, Mich.
Deynor Corp., 1 Depot Plaza, Mamaroneck, N. Y.
Dictaphone Corporation, 420 Lexington Ave., New York 17, N. Y.
Du Mont, Allen B., Laboratories, Inc., 760 Bloomfield Ave., Clifton, N. J.
Duo-Safety Ladder Corp., 513 W. 9th Ave., Oshkosh, Wis.
Du Pont de Nemours, E. I., & Co., Inc., Textile Fibers Dept., Wilmington 98, Del.

E & J Mfg. Co., 100 E. Graham Place, Burbank, Cal.
Eagle Signal Corp., Municipal Div., 202 - 20th St., Moline, Ill.
Eastman, Samuel, Co., Inc., 25 Carpenter St., Concord, N. H.
Electronic Protection, Inc., sub., Standard Coil Products Co., Inc., 2085 N. Hawthorne Ave., Melrose Park, Ill.
Elkhart Brass Mfg. Co., Inc., 1302 W. Beardsley Ave., Elkhart, Ind.
Emerson, J. H., Co., 22 Cottage Park Ave., Cambridge 40, Mass.
Eureka Fire Hose Div., U. S. Rubber Co., 1 Market St., Passaic, N. J.
Everson-Ross Co., Inc., 88 Chambers St., New York 7, N. Y.

Fabric Fire Hose Co., Sandy Hook, Conn.
Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.
Falcon Alarm Co., Inc., 243 Broad St., Summit, N. J.
Federal Sign & Signal Corp., 8702 S. State St., Chicago 19, Ill.
Ferno Mfg. Co., 6th & Pine Sts., Greenfield, Ohio
Fire Fighter Truck Co., 3148 Fifth Ave., Rock Island, Ill.
Firetox, Box 362, Orange, N. J.
Fol-Da-Tank Co., Box 361, Rock Island, Ill.
Ford Motor Co., P. O. Box 508, Dearborn, Mich.
Four Wheel Drive Auto Co., Clintonville, Wis.
Fyrepel Products, Inc., P. O. Box 503, Newark, Ohio
Fyr-Fyter Co., The, Fyr-Fyter Div., 221 Crane St., Dayton 1, Ohio

Gamewell Co., 1238 Chestnut St., Newton Upper Falls 64, Mass.
Garrison Mfg. Co., Inc., 4609 E. Sheila St., Los Angeles 23, Cal.
Gas Arc Supply Co., 223 N. 16th St., Philadelphia 2, Pa.
General Electric Communication Products Dept., Electronics Park, Syracuse, N. Y.
Globe Industries, Inc., Medical & Hospital Dept. 125 Sunrise Pl., Dayton 7, Ohio
Globe Manufacturing Co., Pittsfield, N. H.
GMC Truck & Coach Div., Pontiac 11, Mich.
Gold Crest Safety Equipment Corp., P. O. Box 155, Highway 22, Dunellen, N. J.
Goodall Rubber Co., Whitehead Rd., Trenton 4, N. J.
Goodrich, B. F., Company, 500 S. Main St., Akron 18, Ohio
Gorman-Rupp Co., 305 Bowman St., Mansfield, Ohio
Graflex, Inc., sub. General Precision Equipment Corp., 3750 Monroe Ave., Rochester 3, N. Y.
Greenberg's, M., Sons, 765 Folsom St., San Francisco 7, Cal.
Grinnell Co., Inc., 260 W. Exchange St., Providence 1, R. I.

H & H Fire Apparatus, Inc., 725 Tonnele Ave., Jersey City 7, N. J.
Hale Fire Pump Co., Conshohocken, Pa.
Hall-Scott, Inc. (Hercules Motors Corp.), 101 Eleventh St., S. E., Canton 2, Ohio
Halligan Tool Co., 1505 Metropolitan Ave., Bronx 62, N. Y.
Halprin Supply Co., 1355 S. Flower St., Los Angeles 15, Cal.
Hamilton Rubber Mfg. Corp., Meade St., Trenton 3, N. J.
Hanford-Brown Co., Coytesville-On-The-Hudson, N. J.
Hannay, Clifford B., & Son, Inc., Westerlo, N. Y.
Harrington Signal Co., 116 - 17th St., Moline, Ill.
Harron Labs., 42-10 220th St., Bayside 61, N. Y.
Hein-Werner Corp., Waukesha, Wis.
Hercules Motors Corp., (Hall-Scott), 101 Eleventh St., S. E., Canton 2, Ohio
Hess & Eisenhardt Co., 8959 Blue Ash Rd., Cincinnati 42, Ohio
Hewitt-Robins, Inc., 666 Glenbrook Rd., Stamford, Conn.
High Fog Pump Co., 225 S. Rosemead Blvd., Pasadena, Cal.
Homelite Div., Textron, Inc., 308 Riverdale Ave., Port Chester, N. Y.
Hoosier Tarpaulin & Canvas Goods Co., Inc., 1302 W. Washington St., Indianapolis 6, Ind.
Howe Fire Apparatus Co., 1402 W. 22nd St., Anderson, Ind.
Hydra-Clamp Co., 291 Bartlett St., Manchester, N. H.

Industrial Radio Corp., 428 N. Parkside Ave., Chicago 44, Ill.
International Harvester Co., Motor Truck Div., 180 N. Michigan Ave., Chicago 1, Ill.

Janesville Apparel Co., 216 N. Franklin St., Janesville, Wis.
Johnson Motors, 6200 Pershing Rd., Waukegan, Ill.

Kelco Supply Co., 311 E. 14th St., Minneapolis 4, Minn.
Kellam Mfg. Co., Box 729, Atlanta, Ga.
Keystone Valve Corp., P. O. Box 6716, Houston 5, Texas
Kidde, Walter, & Co., Inc., 675 Main St., Belleville 9, N. J.
Koehler Mfg. Co., 395 Lincoln St., Marlboro, Mass.
Kohler Co., Kohler, Wis.

Lane, E. B., 32 Greenwood Ave., Toledo 5, Ohio
Leece-Neville Co., 1374 E. 51st St., Cleveland 3, Ohio

McCann Products Co., 100 S. Federal Highway, Pompano Beach, Fla.
McDermott, Julian A., Corp., 1639 Stephen St., Ridgewood 27, L. I., N. Y.
McIntire, F. N., Brass Works, Inc., 377 Putnam Ave., Cambridge 39, Mass.
Macchi & Co., 819 Valencia St., San Francisco 10, Cal.
Mack Trucks, Inc., Sidney, Ohio
Mann Edge Tool Co., Box 351, Lewistown, Pa.
Marine Products Co., 515 Lycaste, Detroit 14, Mich.
Marlow Pumps, Div. Bell & Gossett Co., Box 200, Midland Park, N. J.
Maxim Motor Co., 170 Wareham St., Middleboro, Mass.
Medical Supply Co., 1027 W. State, Rockford, Ill.
Memco Aerial Ladder Co., 1007 N. W. 36th St., Oklahoma City 18, Okla.
Midwest Oxygen Equipment Corp., 1664 W. Ogden Ave., Chicago 12, Ill.
Midwestern Safety Mfg. Co., Mackinaw, Ill.
Miller-Meteor Motor Car Div., Divco-Wayne Corp., S. Elm St., Bellefontaine, Ohio
Milwaukee Electric Tool Corp., 5316 W. State St., Milwaukee 8, Wis.
Mine Safety Appliances Co., 201 North Braddock Ave., Pittsburgh 8, Pa.
Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul 6, Minn.
Monitoradio Div., I. D. E. A., Inc., 7900 Pendleton Pike, Indianapolis 26, Ind.
Morning Pride Co., 1986 Home Ave., Dayton 3, Ohio
Motorola, Communications & Electronics, Inc., 4501 West Augusta Blvd., Chicago 51, Ill.
Mountain States Equipment Co., 1238 Speer Blvd., Denver 4, Colo.
Mueller Co., 512 West Cerro Gordo St., Decatur, Ill.
Myers, F. E., & Bro., Co., Orange St., Ashland, Ohio

Natale Machine and Tool Co., 339 State Highway 17, Carlstadt, N. J.
National Coaches, Inc., Main St., Knightstown, Ind.
National Foam System, Inc., Union and Adams Sts., West Chester, Pa.
National Trading Co., 202 Camden St., Newark, N. J.
National Trophy Sales, Inc., Dept. FE, 75 W. Van Buren St., Chicago 5, Ill.
Naval Co., Old Easton Highway, Doylestown, Pa.
Nielsen-Rionda, Inc., 40 John St., New York 38, N. Y.
North American Signal Co., 220 S. State St., Chicago, Ill.
Notifier Corp., 239 S. 11th St., Lincoln 8, Nebr.

Oberdorfer Foundries, Inc., Thompson Rd., Syracuse 1, N. Y.
Onan, D. W., & Sons, Inc., University Ave. at 25th, S. E., Minneapolis 14, Minn.
Oren Roanoke Corp., 1201-09 W. Salem Ave., Roanoke 16, Va.
Oxygen Equipment & Service Co., 8335 S. Halsted St., Chicago 20, Ill.

Pacific Marine Supply Co., 1223 Western Ave., Seattle 1, Wash.
Pacific Reflex Signs, Box 323, McMinnville, Ore.
Parco Products Co., Pennsburgh, Pa.
Parkhurst, Richard M., 510 Madison Ave., Dunellen, N. J.
Perfex, 41 Dinsmore Pl., Brooklyn 8, N. Y.
Phonalarm Div., Angelus Industries, Inc., 5353 Strohm Ave., North Hollywood, Cal.
Pioneer Gen-E-Motor Corp., 5841 W. Dickens Ave., Chicago 39, Ill.
Pirsch, Peter, & Sons Co., 1308 35th St., Kenosha, Wis.
Plectron Corp., P. O. Box 7, Overton, Neb.
Porter, H. K., Inc., 74 Foley St., Somerville 43, Mass.
Porter, H. K., Co., Inc., Quaker Rubber Div., Tacony & Comly Sts., Philadelphia 24, Pa.
Potter-Horn, Inc., Statler Bldg., Boston 16, Mass.
Power Equipment Co., 6000 Paseo St., Kansas City 10, Mo.

Powhatan Brass & Iron Works, Ranson, W. Va.
Pyrene—C-O-Two, Div., Fyr-Fyter Co., The, U. S. Highway 1, Newark 1, N. J.
Pyrotronics, Div., Baker Industries, Inc., 10 Empire St., Newark 12, N. J.

Quaker Rubber Div., H. K. Porter Co., Inc., Comly and Tacony Sts., Philadelphia 24, Pa.

Radio Corp. of America, Communications Products, Bldg. 15-1, Camden, N. J.
Ray-O-Vac Co., 212 E. Washington Ave., Madison 10, Wis.
Reese, S. H., 57 Warren St., New York 7, N. Y.
Republic Rubber Div., Lee Rubber & Tire Corp., 1410 Albert St., Youngstown 1, Ohio
Rockwood Sprinkler Co., 38 Harlow St., Worcester 5, Mass.
Ross Valve Mfg. Co., Inc., 8 Oakwood Ave., P. O. Box 597, Troy, N. Y.
Rupert Safety Belts, Div. Rupert Parachute Co., Inc., P. O. Box 146, Wheeling, Ill.
Russell Uniform Co., 192 Lexington Ave., New York 16, N. Y.

Safa Alarm Div., Inc., Fyr-Fyter Co., The, P. O. Box 1118, U. S. Highway #1, Newark 1, N. J.
Safety Clothing & Equipment Co., 1990 E. 69th St., Cleveland 3, Ohio
Safety First Products Corp., 175 Saw Mill River Rd., Elmsford, N. Y.
Schneck Textile Fibre Co., P. O. Box 473, Narberth, Pa.
Scott Aviation Corp., 207 Erie St., Lancaster, N. Y.
Seagrave Corp., 2000 S. High St., Columbus 7, Ohio
Sharpsville Steel Fabricators, Inc., 6th & Main Sts., Sharpsville, Pa.
Smith, D. B., & Co., Inc., 414 Main St., Utica 2, N. Y.
S-T Hydrant Wrench Co., P. O. Box 921, Holyoke, Mass.
Stephenson Corp., Box 392, Red Bank, N. J.
Sterling Siren Fire Alarm Co., Inc., 8 Bartlett St., Rochester 8, N. Y.
Superior Coach Corp., E. Kibby St., Lima, Ohio
Superior Signal Co., Inc., 6 Colfax St., South River, N. J.
Super Vacuum Manufacturing Co., Inc., 319½ E. 17th Ave., Denver 3, Colo.

U-C Lite Mfg. Co., 1050 W. Hubbard St., Chicago 22, Ill.
Uddstrom, P. R., Co., Vernon, N. Y.
United States Rubber Co., 1230 Ave. of the Americas, New York 20, N. Y.
Unity Manufacturing Co., 2909 Indiana Ave., Chicago 16, Ill.
Universal Fire Apparatus Corp., P. O. Box 187, Logansport, Ind.
University Loudspeakers, Inc., 80 So. Kensico Ave., White Plains, N. Y.

Valley Fire Truck Co., 59 Tuscola Rd., Bay City, Mich.

Washington Products Co., 240 S. Fayette St., Washington Court House, Ohio
Waterous Co., 80 E. Fillmore Ave., St. Paul 7, Minn.
Waukesha Motor Co., West St. Paul Ave., Waukesha, Wis.
W-B Manufacturing Co., 157 No. Wasco St., Wichita, Kans.
Welders Service, Inc., 1033 E. Ohio St., Pittsburgh 12, Pa.
Wentworth-Forman Co., Inc., 21 Edinboro St., Boston 11, Mass.
Whelen Engineering Co., Deep River, Conn.
Willson Products Div., Ray-O-Vac Co., 212 E. Washington Ave., Madison 10, Wis.
Wincharger Corp., E. 7th & Division St., Sioux City, Iowa
Winpower Mfg. Co., Newton, Iowa
Wooster Brass Div., Fyr-Fyter Co., The, 1415 E. Bowman St., Wooster, Ohio

Young Fire Equipment Corp., 1548 William St., Buffalo 6, N. Y.

Just how much better is

EUREKA

Multiple-Woven

than ordinary Fire Hose?

EUREKA's exclusive *multiple-weaving* process, employing filler cords of "Dacron"*, produces top-quality fire hose with these outstanding advantages:

- 50% stronger—withstands 600 pounds pressure,
- Weighs one-third less,
- More flexible—handles easier,
- Takes 33% less space,
- Permits more hose to be carried,
- Dries more quickly,
- Provides maximum safe service life,
- Affords no space between jacket plies to collect dirt and water,
- Smooth-interior ply assures highest nozzle pressure.

Long-time users of Eureka Multiple-Woven hose know that the secret of true economy lies in buying the *finest* . . . not the cheapest!

* Du Pont's polyester fiber

"For greater protection to life and property"

EUREKA FIRE HOSE

Since 1875, Specialists in Manufacturing Circular-Woven Rubber-Lined Fire Hose

1 Market Street • Passaic, New Jersey

Division of **United States Rubber**

MANUFACTURERS' NEWS

Continued from page 738

Pacific Mercury Products

Pacific Mercury, 14052 Burbank Boulevard, Van Nuys, Calif., is introducing a complete line of A.C., D.C. and diesel-powered electric plants. The new generators have four-cycle, air-cooled engines with automatic spark advance, built-in electric starter and trickle charge.

At the same time the company announced two new flasher warning lights. Available in neon and transistor models with operating mechanism sealed in plastic, the lights are said to be vapor-proof and impact-resistant. The cast aluminum housing has a threaded steel insert for easy attachment to a stand or barricade.

Feather-Lite Salvage Covers

The Hoosier Tarpaulin and Canvas Goods Co., 1302 West Washington Street, Indianapolis 6, Ind., is producing vinyl coated nylon salvage covers said to be 40 per cent lighter than dry canvas and 75 per cent lighter than wet canvas covers.

Other advantages claimed for the waterproof covers are high flame-resistance; ease of handling, proof against mildew.

CAA Certifies Transland Fire Fighting Plane

Transland Aircraft, a division of Hi-Shear Rivet Tool Co., 2600 West 247th Street, Torrance, Calif., announces that its Ag-2 farm and forest airplane has received Type Certificate No. 4820 from the Civil Aeronautics Administration.

The all-metal low-wing monoplane, although designed for agricultural spray purposes, has been successfully employed in some recent California forest fires. It was found especially useful for water and water-borate drops in remote forest areas.

Clayton Patrol Boat

Clayton Skiffs, Inc., Fischer Boulevard, Toms River, N. J., has developed a shallow-draft multi-purpose fire patrol boat, featuring lapstrake construction. A 26-foot model is powered by a 225-hp engine and mounts a 750-gpm pump; a 34-footer has a 450-hp engine and 1500-gpm pumps.

The boats are equipped for use in first aid, rescue, fire fighting and patrol work. They are said to be exceptionally fast and maneuverable and carry a large assortment of tools and equipment.

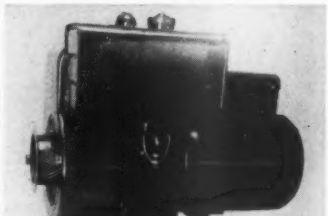
Akron Distributes Unox

Akron Brass Mfg. Co., Inc., Wooster, Ohio, has recently been appointed sole international distributor of Unox foam, a product of Union Carbide and Carbon Corp.

General Moves Offices

The General Fire Extinguisher Corp., formerly of Detroit, has announced that its sales and administrative offices are now located at 6801 Rising Sun Avenue, Philadelphia 11, Pa., and requests that all correspondence be directed to the new address.

Norseman Introduces Generator



Norseman Marine, 105 Nevada St., Oshkosh, Wis., has introduced a new line of portable generators with a range of 350 to 2200 watts. The lighting plants are powered by Briggs and Stratton air-cooled engines.

Five New FWD Pumpers for Paterson, N. J.

Chief G. H. Strathearn, Paterson, N. J. Fire Department, puts his department's five new 1,000 gpm pumpers on display. Manufactured by Four Wheel Drive Auto Company, Clintonville, Wis., the compartmentized units feature semi-open type cabs, 250-gallon booster tanks and deck guns.

British Extinguisher Head Confers with Safety First

Find Graucob, chairman and managing director of Nu-Swift Ltd., one of Great Britain's largest fire extinguisher manufacturers, has been in this country conferring with Martin Fleming, president of Safety First Products Corpora-

Continued on page 802

FALSE ALARMS

Lady Logic

"What do you mean you've got nothing to live for?" she asked her despondent husband. "The house isn't paid for, the car isn't paid for, the TV isn't paid for, and you owe your association dues!"

A woman with one of those fuzzy poodles which Ed Wynn called a "siberian mouse hound," swished into a cocktail lounge. Then, ignoring the waiter who came up, she fussed over her fidgety animal, cooing baby talk: "There, there, nobody's going to hurt mama's itsy-bitsy baby."

Finally the dog settled down and the woman turned to the waiter. Without batting an eye, he asked courteously, if somewhat coldly, "Your first dog, madam?"

Kinkchaser occasionally gets off a good one. Like his description of his lady love. "Her face is her fortune—and it runs into a nice figure!"

"I like work," said Captain Cinder. "I can sit here and look at it for hours. You there, Murph'—get on that bright work!"

"Please honey, use both hands," she pleaded with her boy friend as he drove licketysplit along a curving road, with one hand on the wheel and the other around her.

"Gosh, baby, I'd love to," he said, "but I've gotta steer with one."

Con-Fusing!

"Why is it," asked a visitor to the U. S. Mint, "that they stamp 'In God We Trust' on the pennies?"

"That," explained the helpful guide, "is for the benefit of people who use them for fuses."

Moe: "How did you spend this hot weekend?"

Joe: "Fishing through the ice."

Moe: "Fishing through the ice—for what?"

Joe: "Olives."

Chief Clinker was asked what he was going to do when he retired, after 30 years of blaze-beating. "Well," he said, contemplatively, "I guess I'll just get me a place down south far from the bells. For a few months I'm gonna get me a rockin' chair and start rockin'—slowly."

From the Firehouse Observation Post

First blueshirt: "Wow!—look at that gal—pretty as a picture!"

Second blueshirt: "Yeah, nice frame, too!"

Plugwrench says: "Women prefer men who have something tender about them —preferably legal tender.

Worra, Worra!

We worry about H-bombs, then blow our heads off lighting a stove.

We worry about the Russians, and then get run over by a neighbor.

Girl, to her date in a night club. "I think I'll have another drink—it makes you so witty."

Foolosophy

Life's golden age is when the kids are too old for baby sitters and too young to borrow the family car.

Mrs. Fire Fighter: "Doctor, I want to talk to you about my husband—he thinks he's a radio."

Doctor: "That's merely a harmless delusion, madam."

Mrs. F. F.: "Oh yeah? Well he thinks he needs an outside aerial and keeps sticking his foot out of the window."

Daftnitions

Blunderbuss—a baby buggy.

Low neckline—Something you can approve of and look down on at the same time.

First steno: "My new exercises are talking the weight off me fast. Twenty times a day I take a deep breath and pull in my stomach."

Second steno: "You just pull in your stomach? Where does the exercise come in?"

First steno: "Bending down to pick up my panties."

In a recent safety quiz a safety engineer asked a group of fire fighters this question: "What steps should be taken if you find a basement full of gas fumes?"

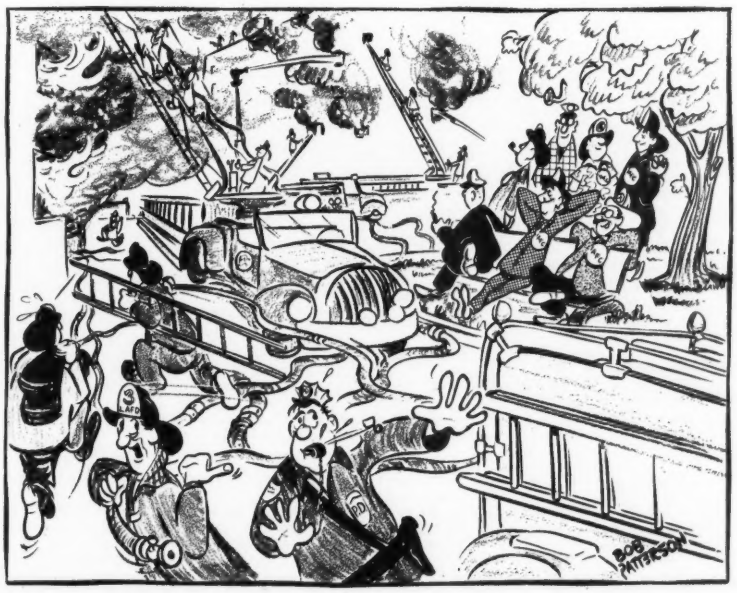
From the back of the room came the answer, "The basement steps—two at a time!"

One of the greatest mysteries of life is how the boy who wasn't good enough to marry your daughter can be the father of the smartest grandchild in the world.

We love that one about the small girl who with her daddy had been watching a frustrated golfer trying to get out of a sand trap. When the exhausted duffer paused to get his breath, the little one said, "He stopped beating it, Daddy, I think it must be dead."

"Have you ever been pinched for going too fast?"

"No, but I've been slapped!"



"Don't disturb the boys at the bench, officer—they're 'visiting firemen'!"

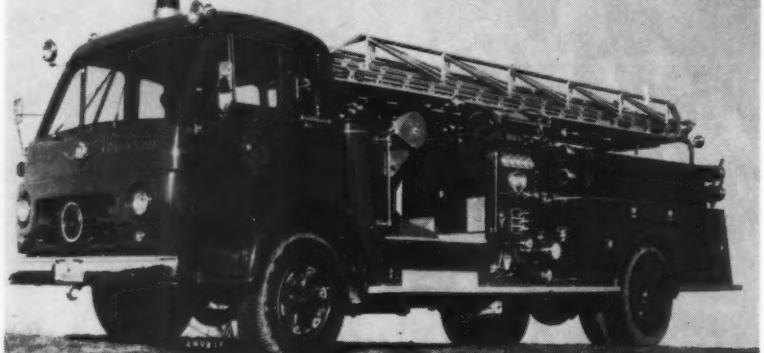
MEMCO AERIAL LADDERS

are used in bunches by

AMERICAN FIRE APPARATUS COMPANY

Plants at Battle Creek, Michigan and Marshalltown, Iowa

These three aerial trucks have been built and delivered this year, and there are still more to go out of American's Battle Creek factory soon. This series of photographs shows American's ability to adapt their apparatus along with MEMCO AERIAL LADDERS to any make of truck chassis. Each of these trucks is equipped with American's 750 gpm Duplex Multi-stage midship pump.



This job, on an International Harvester chassis, built for Patterson Township, Beaver Falls, Pa., features a 50 foot MEMCO AERIAL LADDER

This job, on a Ford chassis, built for Big Rapids, Michigan, features a 65 foot MEMCO AERIAL LADDER

This job, on a White chassis, built for Willowvale Fire Company, Chadwicks, New York, features a 50 foot MEMCO AERIAL LADDER

Your Department can afford one of these reasonably priced aerial ladder truck combinations. Ask your American Fire Apparatus Company salesman for details on how you can buy this modern apparatus.

MEMCO AERIAL LADDERS are built in 50 and 65 foot lengths. They are operated electrically by using power from the truck battery system. May we send you a copy of our current catalogue?

MEMCO AERIAL LADDER COMPANY

1007 N. W. 36th Street, Oklahoma City 18, Oklahoma 'Phone JAckson 5-6828

LOS ANGELES CITY

Continued from page 672

Our working conditions have also improved. Our new fire stations are both attractive and easy to maintain, and our deputy chief of building administration is currently seeking ways of improving the design and reducing costs. Hose towers are almost a thing of the past, and so are sliding poles wherever we can obtain enough land to put all our quarters on a single floor. One of our seven new stations in the San Fernando Valley is being constructed in connection with a third new training center, having classrooms, dormitory, drill tower, drafting pit, etc. Stations are better equipped also, with stoves, refrigerators, electric garbage disposals and similar items, formerly purchased by firemen, now being provided by the city.

Selective alarm system

We do not jump in and out of bed all night long to check every box alarm which comes in for the entire city, for with our selective system only those companies are alerted which must respond. Neither do we post a desk watch all night in each station, for our fire dispatchers (also firemen) keep tabs on all apparatus movements, including reserve rigs.

We are getting away from the loud gongs which cause your heart to pound when awakened out of a sound sleep and have installed chimes instead of telephone bells.

If the day should arrive when the telephone or the television industry should find it practicable, we may be able to receive fire alarms from every customer subscribing to an auxiliary service by means of automatic fire alarm systems installed in homes and other buildings using their services. In the meantime, we have already installed in our dispatching offices three registers of private companies which provide a fire alarm reporting service in addition to our municipal system.

Counseling services

In the field of human relations, we not only study them, but we try to practice them. If a man has a problem, he can discuss it with his commanding officer as in the past, or he may now make an appointment with one of the officers in the counselling service established in the personnel bureau and the matters are not limited to grievances, but may include personal, marital, legal and similar difficulties. Every effort is made to secure for the man the kind of advice or assistance he needs.

We have also revised our board of rights procedure so that an accused member, in addition to retaining an attorney, may select an officer of our department to help him interview witnesses and to prepare his defense, while at the same time, an officer of equal rank is selected by us as the department advocate to interview witnesses, present the charges and plead the case for the department

before the chiefs on the board of rights selected by the accused.

Merit pay raises are provided for members who have served faithfully for the required interval of years, commencing with a performance evaluation at the completion of 10 years. This is an innovation more recent than the betterment of our pension plan which now permits a member to retire after 20 years of service at 40 per cent of his average pay for the past three years, with percentage increases granted annually until he may finally draw two-thirds of his pay after 35 years service. Moreover, the new man coming on today can acquire the right, after five years of service, to be retired on 40 per cent of his pay if he should become disabled through some off-duty accident, with an equivalent amount to his widow should he finally succumb. Widows of men killed in line of duty have long been entitled to extra allowances for children under 18 years of age, the amount increasing with the number of offspring, but it has been only in recent years that this provision has been made applicable to widows whose husbands were killed when not on duty.

Fire service responsibility

Another and most important way in which our department has improved, has been its sense of responsibility to the fire service. Because of the progressive attitude of our fire commissioners, we have not only trained many members of other American and foreign fire departments, but some of us have been permitted to give assistance to embryo fire organizations in Mexico, Indo China, Korea, Guam and wherever requested. In a consulting capacity, we have also advised the public administration experts on the organization problems of fire departments in surrounding communities. We have furnished men to conduct their pumper operator examinations and many chiefs serve on oral interview boards for promotional exams throughout the state.

A number of our officers are members (some are chairmen) of various committees of the National Fire Protection Association and the International Association of Fire Chiefs, and are helping to develop national standards in the fields of flammable liquids, gases, chemicals and explosives, reflecting the thinking of the fire service in these fields. Our chief engineer, William L. Miller, is president of the Southern California Fire Chiefs Association and vice-president of the California Fire Chiefs Association; he is on the NFPA board of directors and on the California State Advisory Board. Many of our officers have contributed addresses or articles to the national meetings and publications representing the nation's interest in fire safety, and some have served as lecturers in various courses leading to degrees in engineering and fire administration in the two local universities and seven junior colleges.

Thus, in a way, we have been trying to help the fire service as a whole to achieve a status of greater professionalism.

But we make no claim that this has

SAWZALL SAVES LIVES!

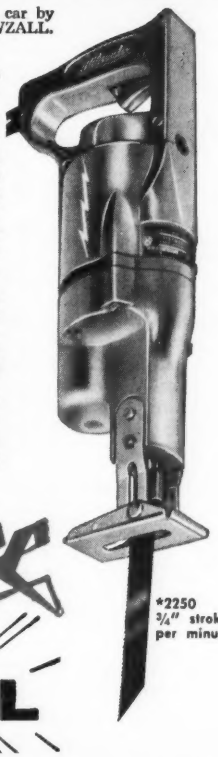
Injured woman being quickly and safely removed from wrecked car by Atlanta, Ga., firemen shown sawing through car panel with SAWZALL.

• Seconds count in any emergency! And that's when you can count on SAWZALL. It cuts fast* ... in metal, wood or any sawable material ... runs cool and is easy to maneuver with one hand.

The perfect and ***proven*** rescue tool ... acclaimed by hundreds of fire and police departments. As one chief puts it "It's great for cutting lock bolts in those thick doors and prevents breaking glass." No fire or heat hazards. Fast and safe, too, for removing youngsters stuck in grates, railings, etc.

Milwaukee-built 115V. AC-DC motor. Operates off alternator or other electric generating equipment. Ball and roller bearings. Weight 6¾ lbs. Length 14½". Furnished in steel carrying case with full set of assorted blades for sawing all materials **$94.50**

Act now to equip your fire, safety and rescue crews with SAWZALL. Be ready for every emergency or forcible entry need. **Write for Bulletin SW-6, Milwaukee Electric Tool Corporation, 5354 W. State St., Milwaukee 8, Wis.**



*2250 ¾" strokes per minute

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The ORIGINAL and FINEST Portable Power Hacksaw

Get smoke out, get air in

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CONTROLLED VENTILATION UNITS

NOT JUST A FAN... but a powerful vacuum-action air screw... Super Vac is amazingly simple in operation, made possible by the efficient design of the **powerful propeller** that is the heart of the unit. This patented propeller produces 100% pulling or blowing power over its entire surface.

Proved method of saving lives while also reducing smoke damage

Fire departments **nation-wide** attest to the speed with which Super Vac provides **controlled ventilation**... so necessary in modern fire fighting. This multi-purpose unit primarily (1) gets rid of smoke and fumes through its powerful vacuum action... or, (2) furnishes a tremendous blast of fresh air into the smoke-congested area, reducing the dangers of combustion and asphyxiation. Although one unit is often sufficient, **complete controlled ventilation** can be more speedily accomplished by using two or more units... one or more units **pulling out the smoke and fumes** while the remaining units **blow in a steady supply of fresh air.**

★ **Highly portable... operates in any position**
★ **Design permits vertical stacking**
★ **Made in 16" and 24" sizes**
★ **AC or DC, regular or explosion-proof motors**
★ **Choice of red or white baked enamel finish**
★ **Running board mounts available**

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SUPER VACUUM

SUPER VACUUM MANUFACTURING CO., Inc
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been a one-department struggle; this effort has been in partnership with the many progressive fire departments, universities and other organizations in our community, the United States and throughout the world, who have cooperated in this common endeavor.

A look into the future

I should now like to take a look at the future. The advancements which lie ahead are only limited by our own vision and faith for an even better service which can yet be provided.

While not pretending to be a student of the crystal ball, I will try to outline a few of the developments which we must consider if we wish to keep pace with modern trends in technology and humanities engineering. Unless we continually re-evaluate our methods of operation, we may become stagnated and drop behind the advances of science and administration. Let us glance at some of the areas where we may be affected.

With the continued national pressure for a 40-hour working week, we may be driven into a dilemma where we either must work three 8-hour shifts a day or make some other arrangement, such as working every fourth day, but the possible detriment to the fire service in either event must be very seriously weighed against the ephemeral advantages which might accrue.

Uniforms will be more modern in design, with greater choice of weights; our new uniform specifications, which must be adhered to by every supplier, closely follow those of the standard Navy officer's uniform, but with our own buttons and insignia, thus making it easier for our officers to obtain and less expensive. The day will come when firemen seeking professional status and pay may be able to discard their dungarees which they now use part of the morning, and dress in a professional manner all the time. Many fire departments, notably the ones in the states offering lower salaries, already provide uniforms to all their members, or at least an allowance of a stipulated amount each year. Here in California, where the salaries are generally higher than in many parts of the country, this practice is not so prevalent.

Because of the state requirements imposed by the division of industrial safety, it is not unreasonable to expect that the provision of protective clothing and safety gear, i.e., turnout coats, pants, boots, helmets, gloves, goggles, and breathing apparatus, will eventually be supplied by the city to every member in the department. There is not the slightest doubt that when every man has his own personal breathing apparatus in constant readiness for use that a well-trained team of men who constantly work and drill together will be better able to make entry and reconnaisance, effect rescues, ventilate and get to the seat of the fire for rapid control. More lives can be saved and less man-hours lost through respiratory injuries.

All our fire apparatus will soon be equipped with safety belts. Non-skid

paint for running boards, flashing lights for rear of apparatus, and rope handles on chock blocks are a few of the items being tried.

We are presently providing light-reflective front pieces for all our helmets, and are testing light-reflective tape on turnout coats in every battalion. Some day a helmet may be invented with a styrofoam liner and plastic face shield to provide greater protection from shock and heat, and when equipped with a small pen-light-battery-powered transistor radio receiver on the command frequency, there could be improved coordination at every emergency.

Instead of carrying debris out of a building by hand on tarps and rubbish carriers, we can now call for our own wheelbarrows, power-operated skiploaders, and use forklifts to lighten the overhauling work at large fires. Our firemen are taught to operate power equipment as part of their in-service training. While we now have jackhammers to go through concrete floors and pier decks, chain saws to go through wooden roofs and timbers, acetylene torches to go through steel walls and doors, we will one day have the fluorine torch which can cut through walls of brick, concrete and steel as easy as any other substance. Shaped explosive charges, small in size but with Monroe effect, could also be used by our demolition company to quickly make cellar nozzle openings in piers and wharves.

Quick couplings, such as the type used in the British or German fire service may some day be used on all fire hose so that you need never be concerned about whether you have the male or the female end of the line, since either end will fit.

Fire trucks will be lighter in weight, shorter in wheel base, and have power steering, power brakes, automatic transmissions, some with front-mounted power winches, and with more horsepower and less gingerbread. We expect our fourth fire boat to be diesel-powered, but eventually the gas turbine engine such as is now available on lightweight, portable pumps, may supplement the diesel engine. Aerial ladders, 165 to 195 feet in reach, are already in use in some cities, some with elevators to carry a fireman and the fire victim he has rescued from an upper floor. With few exceptions, we could reach the roof of practically every building in the city with such ladders, and if such apparatus is otherwise suitable, perhaps it is only a matter of time until we become so equipped.

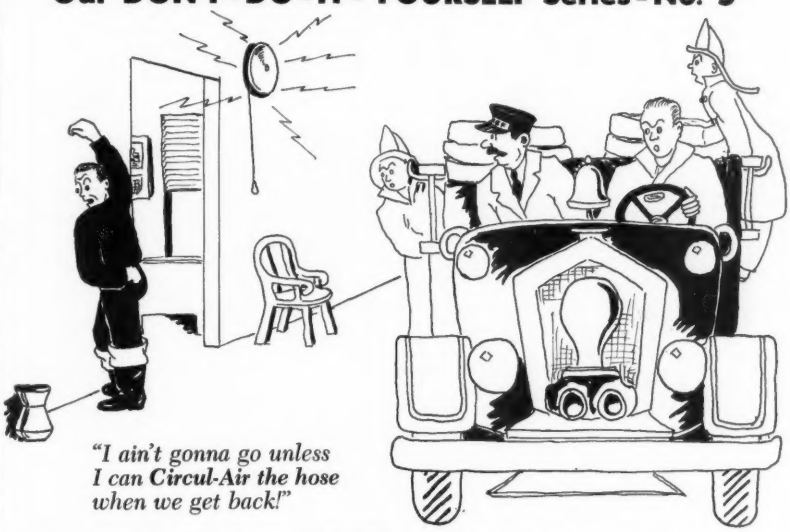
Trailer elevators which can be towed to a fire have been tested here for lifting men and equipment to moderate heights. Some foreign departments use a scissors-type elevator in fire fighting, and their usefulness might be investigated.

We hope to obtain in the near future a truck-mounted ramp, similar to the ones used for removing baggage from aircraft, to more quickly remove disabled passengers from a crashed airplane.

Small helicopters are already in use in our department (on a contractual basis) for reconnaissance purposes, and some of our own firemen are helicopter pilots and instructors.

We recently witnessed tests of a larger

Our DON'T-DO-IT-YOURSELF Series-No. 3



"I ain't gonna go unless I can Circul-Air the hose when we get back!"

We can't blame the guy . . . CIRCUL-AIR equipment is a happy change from the "horse-and-buggy" days when fire hose was scrubbed with a broom (if at all) and condemned to an early death-by-hanging or by baking in the sun.

No more struggling with a 60-pound load in the upper reaches of a tower . . . no couplings falling on your noggin . . . in fact, no more booby traps at all when you "switch to CIRCUL-AIR" . . . the ONLY complete hose-servicing equipment that assures maximum life by proper cleaning, drying and storage.

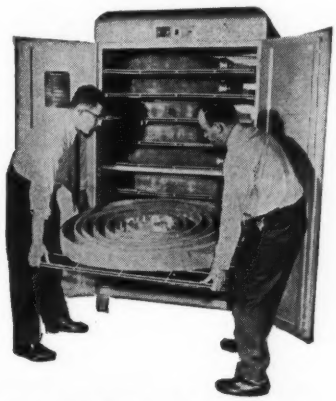
It is the safest, fastest, easiest-to-use equipment that actually revolutionized Fire Station Design.

CIRCUL-AIR

The ORIGINAL

Electric Hose Dryer

- Eliminates Ugly Hose Towers
- Dries Hose in a Few Hours
- Dries Fire Clothing, Too
- Keeps ALL Hose in Service
- Reduces New Station Costs



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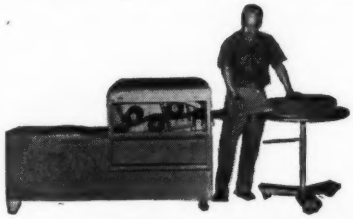
***Roto-Jet* "Automatic" HOSE WASHER**



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Valley Champion Basic Specifications

Mounted on Willys 4-WD FC-170 Special chassis—103½" W.B.–115 H.P. Engine–Full Cab–500 G.P.M. Mid-Ship Pump Class "A"—200 Gal. Booster Tank & Reel–150'–1" hose–Hose Bed Capacity 1000' of 2½" and 500' of 1½"—Ladders, Axe and Pike Pole —Compartment 20" x 20" x 60"—Complete Fire Equipment as pictured—2 lengths of 4" suction hose—6¾ Ft. Wide 20 Ft. Long—write for complete specifications and Prices.

THE CHAMPION WILLYS 4-WHEEL DRIVE FC-170 FIRE TRUCK

Also available on the Willys L6226 Model and International chassis

500 G.P.M. Class A Triple Combination Pumper Mounted on Willys 4-Wheel Drive Special Heavy Duty Fire Truck FC-170 Chassis.

Here is a Fire Fighting Truck that will do everything that a large one will do, and can go places and fill the need that others CANNOT. Powered by the famous Super Hurricane, 6 cylinder, 115 H.P. engine the Champion looks like big fire trucks.

Off the road fire fighting, no other can follow the Willys Champion Fire Truck. You may pump and move fire truck in motion.

This WILLYS CHAMPION, 4-WHEEL DRIVE, all purpose fire truck is suited for Villages, Cities, Townships, as well as Industrial and Commercial Fire Protection.

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model which can carry up to 5,000 pounds pay load (350 gallons of water or 19 men) for use at major watershed fires.

Guided missiles carrying suitable extinguishing agents may some day be used to attack brush fires in inaccessible terrain under zero flying conditions. Along this line, rockets have already been developed and tested.

It is not inconceivable that we may some day carry extremely lightweight hose lines (made of synthetic fibers and plastic) to upper floors and effect rescues by unconventional methods; flying platforms have already been invented as well as back-pack, one-man helicopters and other propulsion devices. The day will surely come when we will no longer have to take the time to climb lofty fire escapes and tall ladders but can effect our rescues more quickly.

New training center envisioned

In furtherance of our long-range program, we have drawn up a rough pilot plan of what we envision will be our ultimate training center some day. On about 150 acres of land, we hope to provide actual fires in mock-up ships, aircraft, tank trucks, buses, structures, and even a simulated brush fire on mountain terrain. Included in the plan are a fire station, administration building with offices, auditorium, classrooms and library; a building to house both chemistry and photographic laboratory; a television studio, from which we may broadcast some of our training courses, demonstrations, addresses by public officials and chief officers to every fire station by closed circuit or through one of the UHF educational transmitters already in Los Angeles. Living quarters for men undergoing training would include individual rooms, properly furnished to provide an atmosphere conducive to study. A gymnasium, swimming pool, club house, baseball diamond and picnic grounds may be available for use of our men and their families as a side feature.

By establishing the requirement of successful completion of a certain number of courses as a condition precedent to permitting members to take the various promotional examinations, we will provide the motivation and incentive for close attention. Credit could be given in our program for those who complete certain courses in fire administration offered on our TV series; if there happens to be a fire during the time of our telecast, causing a man to miss a session, he could by use of a UHF device on his own television set at home see the same session on the following day when it is shown to the other platoon. Of course, the other four or five thousand firemen within range of the transmitter could also watch if they desired, and in this manner it may be possible to bring about closer understanding and better teamwork among the 48 fire departments in the Los Angeles area.

Finally, with the help of all the officials and agencies who share our determination, we may expect that the Los Angeles Fire Department will achieve a greater realization of its ultimate goals,

that of serving its citizens in the most efficient manner possible, of reducing our fire losses to the lowest possible point, of reducing our operating costs as far as possible consistent with sound practices and in joining with our fellow firemen throughout the world in raising the prestige of our profession while creating a safer place in which to live. □□

LOS ANGELES COUNTY

Continued from page 675

ties, and the California Division of Forestry units in Orange, Riverside and San Bernardino Counties. In addition, there are initial action agreements with the CDF, USFS, Glendale, Pasadena, Burbank, Monrovia, Arcadia, and L.A. City in brush areas. Under these latter agreements, apparatus from both departments respond to fires in the IA zones.

For example, an early July brush fire in Topanga Canyon started on the Hertz Movie Ranch in county territory. Both L.A. City and County equipment responded. The fire did spread north toward the city limits, but equipment massed there stopped the flames with no structural loss. Conversely Los Angeles County's Engine 75 stationed in the hills above Chatsworth often provides first-in coverage for that L.A. City community due to the close proximity.

Uniquely, L.A. City and County have no formal mutual aid agreement, but merely, as one chief explained, "a gentleman's agreement."

L.A. City has been of great help to the County in furnishing assistance during major fires.

"The Los Angeles Fire Department has been generous with its assistance and has helped the County and other departments on many major alarm fires," says Chief Klinger.

County companies regularly respond to brush fires in the Verdugo Mountains back of Glendale and Burbank and the specialized equipment and trained crews are of great value here.

Deputy Chief Duncan and LAFD Administrative Deputy Chief Don Hibbard last year inaugurated a plan by which on joint city-county brush operations, a patrol truck from each department would be sent to the other's command post for field liaison.

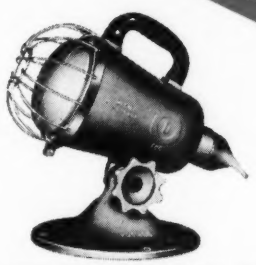
It is now planned to put a County radio in the City's new mobile command post and a City radio in the County's field trailer. Both department's central dispatching centers have had monitors on the others' frequencies as well as direct telephone lines for some time.

But it is the day-to-day mutual aid which often goes unnoticed by citizens.

The routine coverage of the County's Malibu headquarters station by Ventura County rigs and reciprocal coverage by L.A. County; the dispatch of apparatus and specialized equipment such as aerial trucks to small cities in emergencies; the coverage of County stations by Santa Monica and Pasadena equipment during bad mountain fires are a few examples.

"We can't stop at artificial boundary

CIRCLE ® LIGHTS
FIRST CHOICE
of FIRE DEPARTMENTS



No. 150 HIGH INTENSITY FLOOD R-40, 200-300 or 500 W.

Rugged, weatherproof, sealed beam lamp, light weight only 6 lbs. compact 11" high, 9" dia. base. Wired complete with twist lock connector.

NEW

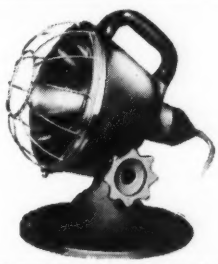
1500 Watt Portable

No. 156M 1500 Watt, R-80 Flood.

Rugged, Weatherproof sealed beam lamp, light weight only 11½ lbs. Compact 13½" high, 9" dia. base. Wired complete with twist lock connector.

No. 150M R-60 FLOODS; 750 or 1000 Watts.

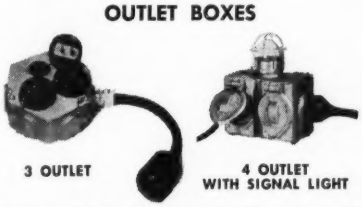
Same basic construction as No. 150, except light designed for larger capacity lamp.



No. 163 HIGH INTENSITY NARROW BEAM FLOOD OR SPOT LIGHT 300 WATT.

Same rugged construction as the 150 series, only lamp housing designed to use the Par 56 sealed Beam rim mounted lamp. 9" dia. base, weight 5½ lbs.

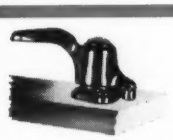
OUTLET BOXES

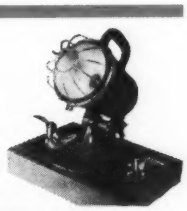


3 OUTLET

4 OUTLET WITH SIGNAL LIGHT

Boxes provide 3 or 4 20A outlets from single feed line. Twist lock connections, completely weatherproof.





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For mounting portable lights on vehicles etc. Hold firm, yet permit quick release when needed. Solid bronze chrome plated.

CIRCLE-D-LAMPS

Are heavy duty, and have a rough service filament, heat and weather resistant glass. Mogul and Medium base. These lamps are designed to match the rugged construction of the CIRCLE-D LIGHTS. For trouble free performance specify CIRCLE-D LAMPS.

You have a lighting problem? — Contact Circle-D—We are constantly keeping pace with the ever growing demands for better lighting.

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are among cities whose fireboats are powered by GM Detroit Diesel engines

LOOK AT THESE RECORDS:
Switch from steam to General Motors Detroit Diesel power on two fireboats saved Boston $42,500 a year over oil-fired pumpers.

Performance of three Philadelphia fireboats at a recent fire—

FIREBOAT 1— 124 hrs. 15 min. pumping service
35,380,000 gals. water pumped on fire
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FIREBOAT 2— 5 hrs., 46 min. pumping service
2,100,000 gals. water pumped on fire
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lines when there's a fire," says Chief Klinger. "Not when our area has so many crazy-quilt lines."

Protection problem broadens

The County's problems have been even more complicated recently by the growing incorporation movements in many areas.

Lakewood was the first city to incorporate several years ago in the current movement. Lakewood decided to contract with the County for all services then being provided.

As far as fire protection, the Lakewood plan merely had the area remain in the consolidated fire protection district, paying the regular district tax.

"We are completely pleased with the services given by the County Fire Department," says Lakewood Councilman Bill Burns.

As other cities incorporated, they, too, decided on the Lakewood or modified plans. A few wanted their own police departments and traffic patrol, but most, impressed by the high grade of efficient service provided, continued County fire protection.

The City of Downey, however, decided to set up its own fire department. A long and somewhat bitter political struggle ensued. Finally, Downey established its own department.

More recently, the City of Santa Fe Springs, adjacent to Downey, moved to set up its own fire service. The outcome is being determined by the courts since many residents desired retention of County protection.

Another growth problem is the booming Antelope Valley north and east of Los Angeles proper. Until a few years ago this region was predominantly agricultural, but today there are jet testing facilities, hundreds of new homes, and corresponding commercial development.

These factors all have combined to raise the need for fire services.

Ten years ago the community of Lancaster had one engine company, No. 33, staffed by several paid County firemen and backed by a corps of well-trained civilian volunteers or callmen. Palmdale's Engine 37 was manned by callmen with a full-time civilian fire foreman in charge of maintaining the rig.

In addition, companies from the County's two nearby watershed stations, 78 at Pine Canyon and 80 at Vincent, would also respond when available.

During the past five years the County has tried to keep pace with Antelope Valley growth with callmen stations being established at Quartz Hill, Little Rock, Pearblossom and Antelope Acres. In addition, Patrol Station 79 at Big Rock was raised to a regular engine company status with a captain and engineer on each shift. This company covers Little Rock and Pearblossom and assists in training callmen in Little Rock and Pearblossom.

An additional station will soon be built in Lancaster. That community now has five full-time firemen on a shift, plus the callmen. Engine 37 at Palmdale now has a captain, engineer and fireman on each

shift and Quartz Hill has a captain on duty.

Engine 114 at the Sheriff's Mira Loma detention facility near Lancaster has been put into operation with a full-time crew and when the new William Fox Airport station is completed the valley's fire forces will be further strengthened. Incidentally, the County has a mutual aid agreement in this area with U. S. Air Force fire fighters at Edwards Air Force Base.

Two full-time battalion chiefs are in charge of Battalion 11 with headquarters at Palmdale. A new dispatching center will soon be established at headquarters.

The department meanwhile keeps its research up to date, not only on methods, but equipment. Tests are now being held on a new high pressure auxiliary pump and consideration will soon be given to equipping apparatus with these pumps.

Department administrators and research men keep in constant liaison with representatives of the underwriters and as new equipment is added, new surveys are requested with reductions in insurance ratings often being effected. L.A. County now has a department Class 2 rating in many of the areas under its jurisdiction.

Meanwhile, there is a movement among over-taxed citizens in the Los Angeles area for a consolidation of city-county functions to ease their burden. There has been much talk, but little action.

However, many civic center observers feel that if, and when, a consolidation of county-city services come, the fire services would be among the first activated.

Although many firemen agree that a metropolitan fire district in the area must come some day, they point out the multitude of problems involved, including different pay scales, pensions and community pride.

Whatever the outcome in years to come, the Los Angeles County Fire Department certainly will be involved in some way in such a metropolitan fire district. □□

ROCKET PROPELLANTS

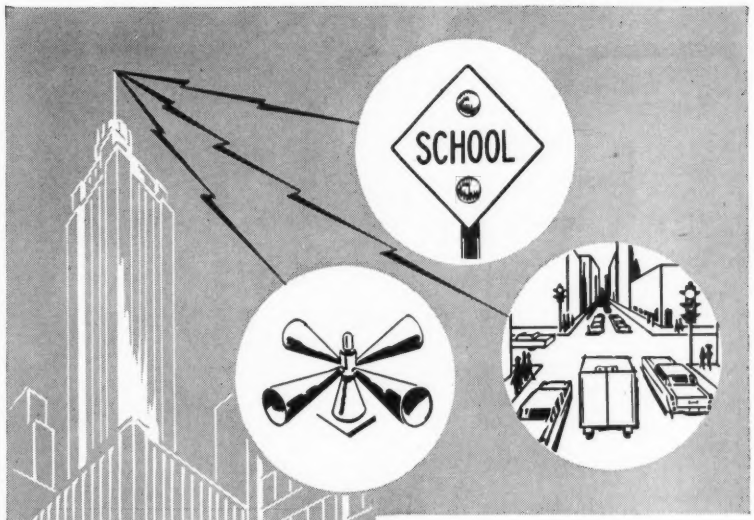
Continued from page 679

Hydrogen peroxide is usually shipped in special aluminum drums containing 300 pounds or in 4000, 6000, or 8000 gallon railway tank cars. Mobile self-contained units for servicing missiles have been developed for field transfer.

The ease with which hydrogen peroxide can be decomposed catalytically into oxygen and steam enhances its value as a propellant. This is particularly true in application as a monopropellant when it is necessary to power a steam turbo pump within the missile.

An interesting related application as a monopropellant is the use of a 280 pound tank of 90 percent hydrogen peroxide on the rotor shaft of a helicopter. The propellant is fed to a small catalyst chamber at the tip of each rotor by centrifugal force and decomposed with the exhaust jet supplying auxiliary driving power for the rotor. As a result of this power assist, pay load, rate of ascent and hovering ceiling are considerably increased.

To be continued



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FIRE ADMINISTRATION INSTITUTE

Continued from page 683

course program. A series of correspondence courses, credit or non-credit, is to be developed for those students who are unable to attend schools or colleges. This would be operated by one participating school or college in the United States on a contract basis with operations administered by the director of the institute or his representative. If a school or college does not come forward to accept a contract for the correspondence course program, the board of trustees may authorize the director of the institute to organize and operate such a program on a non-credit basis.

The third aim of the institute is to offer short, intensive courses at schools and colleges which would immediately prepare firemen and fire officers for managerial problems at work. Courses of this type will be in the category of training rather than education. They may carry elective credit, and probably will be an extension or evening division. □□

EAST RIVER

Continued from page 685

ties. Ladder 118 assisted in stretching lines and in overhauling the burned section. Engines 205 and 224 were employed to supply the bridge standpipe from the Brooklyn side. Ladder 118, together with units of the 32nd Battalion, were directed to examine the shore line. Like units on the Manhattan side, the operation was kept fluid—the various companies not being permitted to firm up in any one location.

The same fluid condition was maintained on the Manhattan side of the East River, where Chief Mendey, Division 1, supervised patrols and later, salvage operations on the Nebraska. He also participated in the action to save the sinking fireboat Gaynor. Only the two companies covering Piers 31 and 29 remained fixed for any time. The balance were occupied in patrol or bridge operations.

Chief O'Brien had directed assignments from three engine and two ladder companies to be transported to the Nebraska as soon as the fire on that ship was darkened down, and the vessel could be boarded to aid the several fire boat crews in final extinguishment and search for victims. This was done. Members of Rescue 1, Manhattan, after treating casualties brought ashore on the Gaynor, responded to the Nebraska. Their assistance, together with personnel detailed from various engine and ladder companies, was welcomed in advancing lines and examining the ship's interior. In company with others operating on the Nebraska, these men wore demand-type respiratory protective equipment.

To secure the manpower to reinforce the fireboat crews, and to further patrol the Manhattan waterfront, Chief O'Brien had ordered a second alarm, at 12:53 a.m. (Box 128). This brought Engines 31, 10, 17, 27; Rescue 1; and Ladder 10. It also resulted in these relocations: En-

gines 221 to 31; 209 to 9; 256 to 7; Ladders 18 to 6 and 20 to 10.

Using heavy fog patterns and powerful straight streams to sweep back floating flames from the fireboats, which were positioned completely around the blazing vessels, the fire on the Nebraska was soon sufficiently cooled to permit fire fighters to gain its decks by means of hook ladders. Heavy 3½-inch lines were thereupon taken aboard and broken into smaller lines which were worked into the interior sections of the ship to knock out fire in that area.

Cavanagh and David in action

While these fire fighting operations aboard the Nebraska were being continued, Fire Commissioner Cavanagh and Chief David arrived, and the latter took command. Investigation revealed that the engineroom crew and the captain of the Nebraska were still aboard and safe. Careful checkup showed all 36 crewmen of that ship accounted for. Two of the Empress Bay's crew were missing and believed dead (their bodies were taken from the sunken tanker several days later).

It required eight hand lines aboard the Nebraska to contain and control the fire in the crew's and passengers' quarters, the cargo, storerooms and other parts of the vessel. More than 20 turrets and deck pipes were employed by the fireboats in overcoming the main body of the blaze in the gasoline slick and on the two vessels. In this effort, the fireboat Mitchel (Engine 232), was given the task of tackling the fire on the underside of the Manhattan Bridge. Two of the boat's big deckpipes were discharged under high pressures and, although the streams reached the bridge structure approximately 160 feet above, the strong current in the river made it difficult for the boat to effectively hold its position. The action therefore was broken off. Prior to all this, power on the bridge, had been cut off.

During the intensified marine engagement, another disaster was narrowly averted when a second tanker loaded with flammables blundered into the scene, reportedly actually brushing the wreckage. Fortunately, a direct collision was averted, but fire fighters had an anxious few moments. U. S. Coast Guardsmen were alerted at their station about a half mile away, by the geyser of flame that shot up. Within minutes, 11 Coast Guard boats were heading for the blaze.

The Coast Guard rendered invaluable assistance both during the fire control operations and later, when the fumes from still escaping cargo of the sunken Empress Bay continued to be a menace to navigation. For 24 hours after the crash the Empress Bay remained half submerged with her blistered bow projecting above water. Then she sank out of sight. The Coast Guard shut off marine traffic on the East River after a conference at 4:00 a.m. between Captain George W. Holsman and Chief O'Brien. At 8:55 a.m. after another conference between Coast Guard and fire department officials including Deputy Chief Hugh A. Halligan at that time in charge of the

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"We examined several other brands," says Chief Charles Toth, "and found this H-R hose with a 4 ply laminated tube stronger, more flexible, and easier to handle. We think it's the best hose on the market."

Above, Tom Karkalla of Howe Fire Apparatus Sales & Service, Pittsburgh, tells Chief Toth: "Look! I'll show you. This hose is so flexible you can tie knots in it, although we don't recommend using it that way." At right, fire company President Al Ehrsam tries it for himself. You'll like the qualities of H-R fire hose, too. Because H-R manufactures *all* types of municipal and industrial fire hose to the highest possible standards of quality, it *pays* to specify Hewitt-Robins.

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Marine Division, it was decided to open one side of the river. All craft was warned by the Coast Guard to take precautions in passing near the wreck. When all danger of reignition of fumes was past, buoys were placed around the sunken tanker, which was abandoned, a total loss.

Coast Guard cooperation was directed by Captain Holtzman, acting captain of the port at the time. The vessels under his command range from fire fighters of the tug type to 42-footers equipped with foam throwing equipment and other gear. The Coast Guard's headaches continued after the fire, when it was necessary to control the miscellaneous river traffic, particularly the many sight-seeing and excursion boats. No smoking was ordered on all craft during the danger period.

Credit of fire fighters and press is also given the tug Dalzellera, Captain Bert Deeley, which assisted in rescue efforts and in disengaging the two locked vessels.

Fireboat Gaynor saved

Another highlight of the action was the successful effort to save the foundering Gaynor, at Pier 31. Even before the scarred Nebraska had been towed around the Battery to Pier 26 North River, where overhauling operations were completed, firemen were concentrating on saving the Gaynor. Prominent in this action were supervising engineers who rushed eductors and other salvage gear to the scene of the fire department's emergency utilities unit. In these operations, fire department pumpers drafted directly from the waterlogged engine room which at one time contained 9 feet of water. Engines 7, 17, 27, 31 and 32, together with units of the Marine Division, Ladder 1 and the EUU were able to lower the water level to permit temporary partial plugging of the leak, whereupon the Gaynor was towed to the Todd Shipyard in Hoboken, escorted by Engines 232 and 86, operating eductors all the way.

Both Commissioner Cavanagh and Chief David, together with Chief Mendes, took part in supervising these efforts to save the Gaynor, and later, to overhaul the burned, blistered and still-smouldering Nebraska which reached Pier 26 under its own power.

At the pier, engine and ladder companies went to work on it. Aerial ladders were raised against the ship from the pier, lines taken aboard and the last vestiges of fire extinguished.

Fire department records show two of the crew of the Empress Bay killed. Thirty-six other crewmen of both ships were hospitalized, most of them with burns. Four fire fighters suffered injuries. They were Captain E. E. Kenny, Engine 77; Firemen E. P. McCarthy, Engine 77; C. T. Schubert, Engine 208 and Philip Prail, Ladder 9 (detailed to Rescue 1).

Summary

Response—A total of 37 Fire Department units were engaged during the approximately 6-hour operation. They included 21 engine companies; eight fireboats; eight ladder companies; two rescue units; mask service unit; searchlight

unit; gasoline oil unit; ambulance and emergency utility unit. Also the tender Smoke.

Operations—Seven hand lines and 20 turret streams were employed in extinguishing operations. The fire department has acknowledged with thanks, the cooperation of the Coast Guard, police department, civilian tugs and harbor craft.

Casualties—Two dead and five injured on the Empress Bay; 31 injured on the Nebraska; an indirect casualty was William V. Finn, photographer of the *New York Journal American* who was fatally stricken while photographing the action.

Losses—Not fully determined at this writing, on the Empress Bay and Nebraska, approximately $500,000. On the Manhattan Bridge, not given but estimated at moderate. On the William Gaynor, loss may run as high as $50,000.

Cause—Responsibility for the collision not determined at this writing. Coast Guard investigating. □□

The editors gratefully acknowledge the assistance of the New York Fire Department particularly Commissioner Edward F. Cavanagh, Jr.; Chief of Department George David; Assistant Chief Thomas P. O'Brien; Chief Supervising Engineer John Jordon and the staff at Manhattan Fire Alarm Communications Office for their special cooperation.

INSIGNIA

Continued from page 694

Most authorities do not recommend regimentation of the fire service to the extent of standardizing uniforms and insignia (the vamps in particular will have no part in it). However, there is general agreement on the fashion, fabric and cut of the professional dress uniform. In the volunteer field, the sky still seems to be the limit with some companies when it comes to parade and "costome" apparel.

True, there have been voices raised in favor of a complete overhaul of the subject of dress and work clothes, and of the best method of indicating fire service rank and ratings. Proponents of change suggest everything from copying the military, to adopting the stars and bars of the police. The problem of identification becomes more complicated as new fire department classifications such as "mask service units," "radiological units" and the like are added. Some believe we have run the gamut of trumpets, axes, pike poles, ladders, life guns, etc., for insignia.

The point is made that there should be some simple way of telling from a distance of a few feet, who is a fire officer and, if so, his branch of the service and rating. There are times, it is claimed, when the rank of an officer in uniform should be readily identified without having to closely scrutinize the insignia to note the number of trumpets. In the same breath it is suggested that stars and other military devices, silhouetted against dress blue of the uniform would be more distinguishable.

The distinctive stripes on the sleeves, like other insignia, vary according to de-

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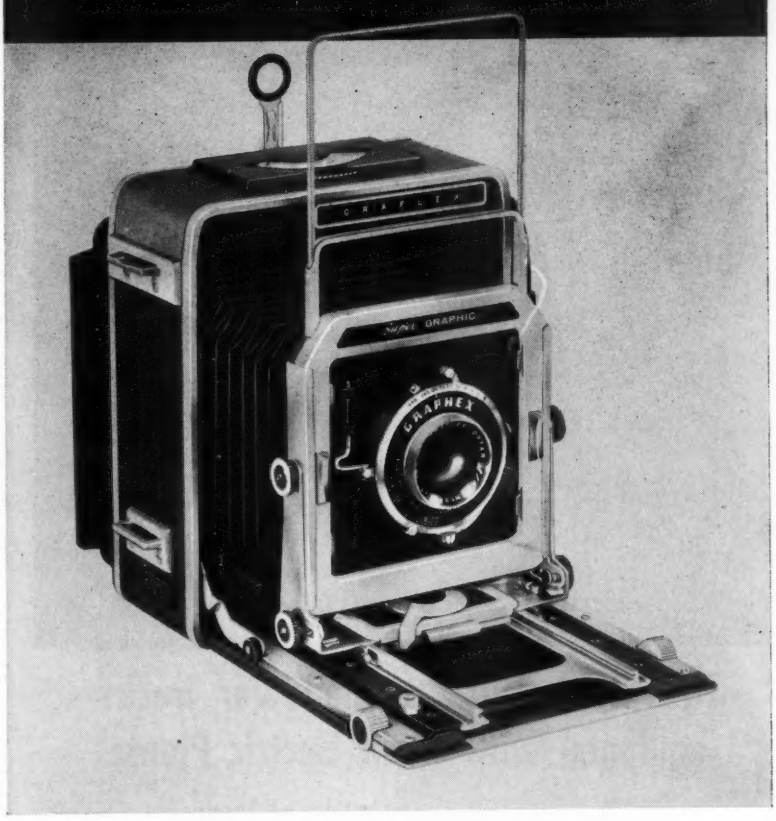

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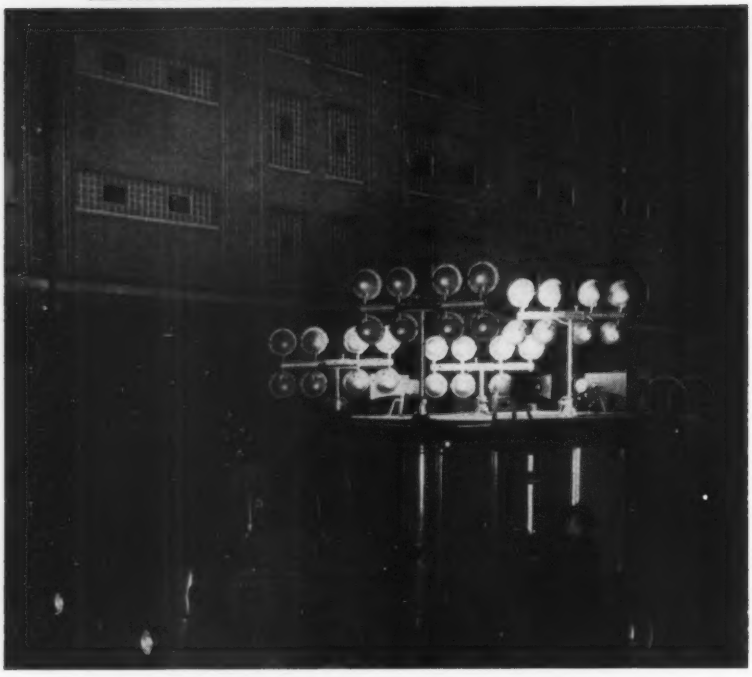

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partments and preferences. On tunics and overcoats they apparently have been a satisfactory identifying insignia to departmental personnel, but it is claimed by some they only add to the confusion of too many markings of little known significance to other services and the public. To most people these stripes seem to signify length of service rather than rank—an interpretation which is sometimes disconcerting to older members of the service who might rate only one stripe and be put down as a man of comparatively limited service and experience.

Meantime, the fire service is able to select its badges and other insignia from a field of uniform and insignia manufacturers who have faithfully and patiently catered to its whims and foibles for as long as there has been an organized fire service. □□

The author acknowledges the assistance of The C. G. Braxmar Co., Inc. in supplying illustrations.

FCC To Review Allocations

The Federal Communications Commission has given notice of its intention to hold a fact-finding hearing concerning service allocation needs in the 25 to 890 mc portion of the spectrum. The commission has stated that it is desirous of obtaining evidence which will assist it in examination and review of its basic frequency allocation policies. All persons wishing to appear and present evidence must submit on or before October 1, 1958, the name of the witness and a detailed outline of the evidence which is to be submitted.

Weak Air Crash Rules?

Little has been done in this country to require airports to provide air crash fire protection, according to testimony at a Civil Aeronautics Board hearing held in Washington.

A Civil Aeronautics Administration inspector said he knew of no regulation requiring crash-fire fighting equipment at airports. A 1948 CAB release that the CAA would check the crash-fire problem was said not to have been implemented.

Marshal O. K.'s "Sack"

California State Fire Marshal Joe R. Yockers is on record as favoring the sack dress. In a recent bulletin to fire chiefs, Yockers said the sack may have strange bulges, but being tight around the hem, it's not as likely to catch fire from fireplaces, wall heaters or ranges.

"We would hesitate to state we approve wholeheartedly of the new, so-called (bag) look, but solely from the standpoint of fire safety, we must admit it is an improvement over earlier styles," wrote the marshal!

PHOTOGRAPHY

Continued from page 688

four 35 mm. slide projectors, one 2½ x 2½ slide projector, two overhead projectors, four 16 mm. motion picture projectors and four screens.

Incidentally, professional training is desirable for firemen who will be expected to take motion pictures.

In the smaller departments, film processing can be done by an outside commercial agency preferably on a contract basis. It should be remembered, though, that in case of photos used for evidence, the courts most likely will insist on the "Chain of Custody," in handling such photos.

For this reason, it may be advisable for even the smaller departments to maintain at least a modest photo lab. The larger departments would definitely want to have their own photo labs. Again, the equipment used by the Minneapolis department may be considered the norm for such labs. It includes one Arkay rotating print washer, three developing and washing trays for prints, one large rotating print dryer, one large Arkay flat print dryer, one small Arkay flat print dryer, one Kodak Auto Focus enlarger, one 4 x 5 contact printer, two 16 mm. film editor and splicer, 4 x 5 film hangers for drying film, one dry mount press, one automatic film dryer, one photo-copying stand and one photo-enlarging stand.

Of course, there should be adequate space for a darkroom and storage space and cabinets for keeping negatives and contact prints.

Finally, as the Minneapolis department points out, "The value of photography and projection to a fire department depends entirely upon the time and effort which they wish to devote to its use." We might add that the success of such a project will obviously depend upon the support of municipal officials in providing the necessary funds.

Organizing and maintaining a photo service within a fire department so as to make it an asset and not a liability takes a bit of doing, but it can be—and is being done.

The publishers acknowledge the assistance of the following in supplying data upon which this article is based: Eastman Kodak Co.; Ansco Div., General Aniline and Film Corp.; Graflex, Inc.; Polaroid Corp.

County Inventory Booklet

The Franklin County, Ohio, Firefighters Association has recently published a 16-page booklet which inventories in capsule form all fire fighting assets of the entire county.

Each fire department is listed by name and its equipment identified in number and size. Included is the telephone number and radio call sign. Each fire department in the county's mutual aid plan has a chart which not only lists all fire personnel and equipment, but gives the mutual aid response assignments.

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Q. How can I recognize a Hi-Light Badge?

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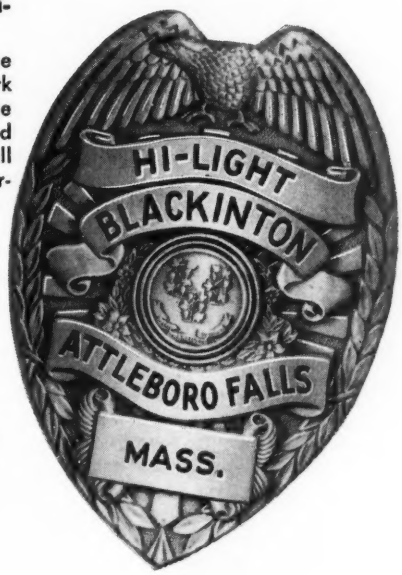

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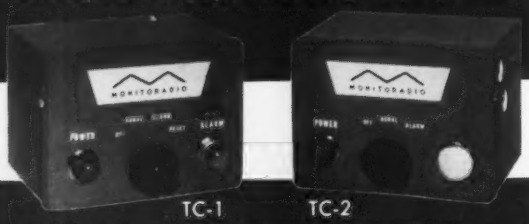

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Long needed dependability at a realistic cost . . . Monitoradio Division of I.D.E.A., Inc., has developed a device for selective group alerting. This is particularly desirable where one transmitter is being used for more than one purpose; as for instance, one transmitter may be used for the Police Department, the Fire Department, and miscellaneous communications.

Two models are available; the TC-1, which is priced at $43.50, is powered and designed for use with Monitoradio Models MRC-10, MRC-33, and DR-200; the TC-2 is designed for use with Monitoradio MCA-100, from which it derives its power, and is priced at $37.50. These units can also be used with similar receivers of other makes.

This equipment, consisting of a tone switch to be attached to the receiver and a tone generator on the base station transmitter will allow selective calling of one or a group of receivers so equipped. The tone switches hold the receivers mute until the proper audio frequency tone is transmitted, at which time the tone switch responds and closes the receiver speaker circuit, allowing the message to be heard. Expressly featured in these tone switches are unique bridging and time delay circuitry which very effectively prevent false triggering from "stray" audio tones; thereby overcoming one of the most heretofore troublesome difficulties with such equipment.

The tone switches require no wiring or cutting into the set circuitry to install. They are small—only 3½" x 4¾" x 3½"—and attractively packaged.

The tone generators are made in models providing 1, 2, or 3 separate audio tones to allow for the alerting of up to three different groups from one transmitter.

Burton Browne Advertising

TG-3 monitoradio
Division of I.D.E.A., Inc.
7900 Pendleton Pike • Indianapolis 26, Indiana

Among the Buffs

By Paul C. Ditzel

LOS ANGELES' BOX 15 CLUB, like the city itself, has grown both in size and maturity since its organization shortly after the famous Markay tanker explosions and fire on June 21, 1947. Box 15, in the San Pedro area of the city, was pulled for the disaster, so the buffs who formed the club felt it was only fitting to follow tradition of their eastern contemporaries and name their club after an outstanding occurrence in the history of their home fire department.

Not long ago the Los Angeles Fire Department replaced its fire alarm box system in the harbor area with a more modern arrangement. Box 15 members were able to obtain the box itself which otherwise would have ended up in a melting pot. I'm given to understand that the weather-beaten box is currently in the possession of George (Smokey) Bass, one of the original guiding lights of the club and himself a Vernon, Calif., fireman. I might add that Smokey's late mother was herself quite a firefanette and one of the finest women it's ever been my good fortune to meet.

The Box 15 Club is the only organization I've heard of that's been fortunate enough to obtain the box from which it takes its name. (Suppose I'll be deluged with mail to make me eat those words!) As Louisiana's Dr. Norm Zaffater would say: "Those boys must be in hog's heaven!"

Any convention visitors in Los Angeles who happen to be in the area around August 23rd are invited by club spokesmen to attend their next meeting. It'll be held at the home of Joe Kerness of 11625 South Van Ness Avenue. In fact, says Box 15 President Fred S. Allen of 5127 Tenth Avenue, anyone interested in the fire service—locally or in generally—is invited to this meeting as to all meetings which are usually held once a month in a member's home.

The club's big project at this time is to assist the State of California in all ways possible with the restoration of the Old Plaza area in downtown Los Angeles. Part of the restoration includes a fire station, believed to be the city's oldest, circa 1896, which in young Los Angeles is ancient.

President Allen says the club has already donated a fire alarm gong and is negotiating with a local harness firm which has patents on the old drop-downs to supply the station with appropriate fittings. Fred's interest in buffing leans to historical material and he has a collection of old buttons, badges, and other material of the old Los Angeles Fire Department.

Fred says that the club hopes to be able to use the restored firehouse for their monthly meetings and the state has given some assurance that this is a distinct probability. Thanks to the energetic work of the Box 15'ers, together with an able assist from retired LAFD Assistant Chief Seth Johnson, the firehouse is tops on the

list of the plans for restoring the pueblo de Los Angeles. Visitors to the convention may see this historical landmark by going to the vicinity of Los Angeles and Main Streets, close to famous Olvera Street. Fire department members, Bob Foster of Engine 17-B and Inspector Kenneth Burton, among others, have been active in this same program.

While visiting Fred at his home I discovered how he became a fire buff. His father was a fireman. I met Captain Fred "Old Kentuck" Allen, Sr., formerly of Engine 34, while I was talking to Fred. The captain seems as spry as I am (which may not be saying much) and is chock full of stories of the old days of the LAFD.

President Allen, a safety engineer for the Pacific Indemnity Company, says the Box 15 Club now has 20 active members, four of them in the military service. They include school teachers, purchasing agents, a UCLA cancer research doctor, a Coast Guardsman, and a grocery clerk.

Not far away lives Fire Buff Jerry G. Colton, a Long Beach, Calif., attorney, who reminded me of the writeup in the Long Beach Firemen's Mutual Benefit Association magazine, *Fire Lines*, telling some of the statistics of the big Hancock oil refinery blaze.

Not long ago San Francisco's Phoenix Society members Sam Clark, Doc Levin, and Clayton Sherman turned out at 7 a.m. to a house fire on Sixth Avenue. The family of a San Francisco fireman, including his expectant wife and six children were completely burned out.

Sam Clark contacted the Red Cross which took complete charge of the family, housing and clothing them. After three hours of assisting, Brer Clark went to his job as vice president of Welles Fargo Bank. (Who says bankers are flint-hearted?) and Clayton Sherman, who spent the same amount of time on this urgent work, reported for work as top salesman for Atkin's Clothing Company. Doc doesn't say what he did, but I imagine he returned to work as wheeler-and-dealer of the best auto supply store in town.

That's "30" for another month. Please keep the anecdotes and club reports rolling to my new mailing address: Box 8731, Crenshaw Station, Los Angeles 8, Calif. See you at the conference! □□

NY Fire Fighters to Meet

The New York State Fire Fighters Association will hold its 20th annual conference at the Lincoln Hotel, Long Beach, L. I., N. Y., September 8 to 11, it is announced by William Cross, president.

Delegates and guests will be welcomed at an open house on Sunday, September 7. The conference will be climaxed on Wednesday evening by the annual banquet with Governor Averell Harriman as guest of honor. Guest speaker will be Assemblyman Joseph Carlino; Frank Farrell, New York *Herald-Tribune*, will be master of ceremonies. Conference general chairman is Robert Cohn, chairman of the state board of directors and president of the Long Branch local.

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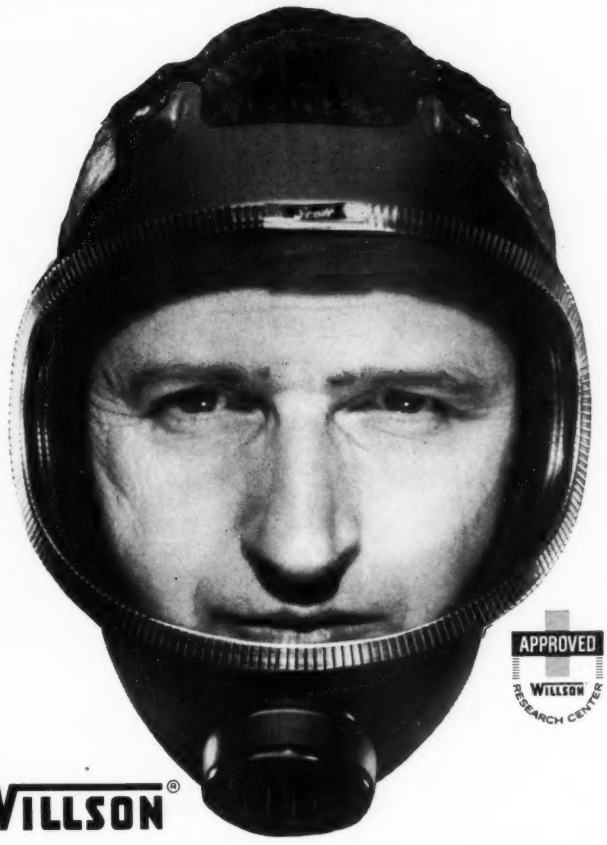

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1½" pipe supports LOK-TITE BRACKETS
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- Simple to install
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FIRE ALARM SYSTEMS

Continued from page 691

and modernize its fire alarm system. A number of others, have done likewise.

Nor are these improvements limited to any single manufacturer of fire communications equipment. Progress is being made in both the wired and wireless communications field and on all fronts. For the first time in many moons, there is a tendency to consider relocating and rebuilding many of our ancient fire communications headquarters, to make them less vulnerable to nature's, and man-made onslaught.

Packaged control units

There are now available "packaged" central office control units which are complete with rectifiers, batteries and all other devices needed for a fire alarm headquarters setup. These new control units reduce costs and improve flexibility; they utilize only a fraction of the space previously required. They have brought automation to the fire service as they automatically repeat box alarms to all points of response. This new equipment has enabled many communities to stretch their fire alarm budgets and put the saved dollars into street boxes to insure wider public use of the signal system.

Similar advances have been made in facilities made available to the general public to enable them quickly and easily to sound a fire alarm. A citizens' emergency call box is now available which can be readily adapted to existing fire alarm systems. It retains the inherent safety, speed and positive identification features of the telegraph fire reporting system, while combining the flexibility of the telephone. The fire alarm section uses a basic coding mechanism housed behind a top door under lock and key; the public has easy access to it. It is connected in series with similar fire alarm boxes on a normally closed metallic circuit. Automatic grounding will make it operate even when circuit is broken or damaged. The lower half of this emergency call box houses a telephone handset connected by direct line circuit to a central switchboard under complete control of the municipality. This allows verbal reports for describing emergencies of a general nature. These calls may then be evaluated as desired by local municipal policy.

This new system of street fire and emergency reporting is completely municipally controlled, independent of complicated wire circuits, can be quickly returned to service after damage, and makes it possible for communities large and small to attain the lowest possible cost for their emergency signal services. Figures 1-4 illustrate early and modern types of fire reporting boxes and the new citizens' emergency call station.

What are the solutions?

In conclusion, there are several possible solutions to a far-sighted program for improving existing municipal fire reporting systems. Reserves can be set up to pro-

vide relief for inadequate central offices, depleted cable plants and poor box distribution. Several municipalities handle this on an annual renewal basis so as to spread the financial burden over a period of years. Fire alarm budgets can be stretched by utilizing new techniques such as decentralization of large central offices into area substations, with consequent savings in line construction and other equipment. Existing systems can be expanded functionally so as to give greater use value by meeting the ever-increasing demands of the modern fire service.

The moral is as plain as a pike pole: in the interest of economy and for the best in protection we should bring our present municipal signal systems to the peak of efficiency and maintain them at top levels. This means appropriation of sufficient funds to properly rehabilitate and modernize—all with the full knowledge that such judgment and farsightedness will bring financial rewards to the community as well as assurance of the ultimate in fire protection. □□

Air Cargo Chemical Code

A new and extended code for handling special cargoes by the world's airlines became effective on March 15. The International Air Transport Association announced that 100 new commodities have been added to the list of those for which special packaging, labeling, stowage and handling are prescribed in the association's regulations relating to restricted articles carried by air.

Included are several types of insecticides and important industrial chemicals such as chlordane, DDT, dieldrin compounds, lindane, peroxide mixtures and sodium borohydride, as well as other substances.

Because of the rapid discovery of new isotopes and new uses for them throughout the world, airline experts who administer the code are now studying the possibility of enlarging the range of radioactive commodities which the airlines will accept for shipment under prescribed conditions.

June Fire Losses

Estimated fire losses in the United States during June amounted to $90,048,000, the National Board of Fire Underwriters has reported.

According to Lewis A. Vincent, NBFU's general manager, this $90,048,000 loss represents an increase of 29.2 per cent over losses of $69,710,00 reported for June 1957, and an increase of 5.2 per cent over losses of $85,633,000 for last May (1958).

Losses for the first six months of 1958 now total $581,235,000, an increase of 5.6 per cent over the first six months of 1957, when they amounted to $550,155,000.

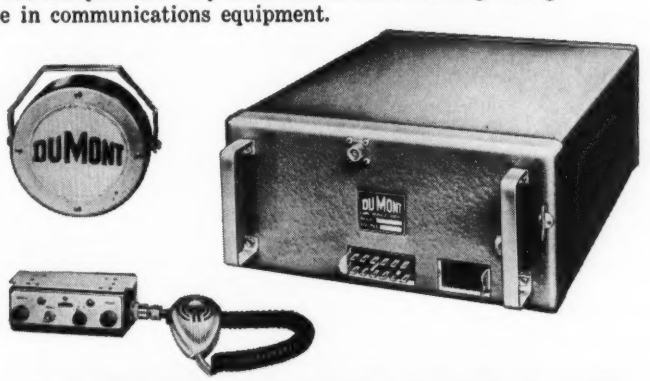
These estimated losses include an allowance for uninsured and unreported losses.

DEPENDABILITY
WHEN IT COUNTS

When seconds can be measured in life and property, the stakes for dependable performance are high. And at such a time, Du Mont 2-Way Radio dependable performance pays off . . .

Du Mont 2-Way Radio is designed to provide the service expected by firematic organizations. It's produced by personnel unexcelled in the design, and manufacture of 2-Way Radio. Competent local authorized Du Mont service organizations assure top-notch maintenance of the equipment at all times.

Investigate. Compare Du Mont with any other 2-Way Radio and see for yourself why Du Mont is the fastest growing name in communications equipment.



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DU MONT
2-WAY RADIO

MOBILE COMMUNICATIONS DIVISION,
ALLEN B. DU MONT LABORATORIES, INC., CLIFTON, N. J.

THE WATCH DESK

overhauling the firemanic news of the day

High but not Dry!

Frank Ivan, of New Haven, Conn., went out for a little celebration on July 10. It turned out to be a beach party with half a dozen New Haven firemen.

Police said Frank may have taken just a wee bit too much before he stumbled into Mill River. In any case the water came as a surprise to him.

His shouts for help were heard by a gasoline station attendant who jumped into a small boat and pulled the victim from the water.

A police boat, several squad cars, a fire emergency unit, a fire engine, an ambulance and a score of fire fighters all joined the party. Frank and his rescuer were high, if not altogether dry, in the boat making for a landing when the six firemen decided to lend a hand in hauling rescuer and rescued to the pier.

Seconds later, Frank, his rescuer and the six firemen were all in the water. The pier collapsed. Frank finally made it to a hospital in the ambulance. His condition, reported later, was "very happy."

However, the six New Haven firemen were not so gleeful.

Tom Magner

NEW • LOW COST

2-WAY RADIO
can be installed in
ONE MINUTE

Temporary installation of 2-way radio in any car for emergencies or during heavy traffic load periods can be accomplished with the new Industrial Radio Portable/Mobile in 60 seconds.

The Portable/Mobile is a completely new design to meet the combined problems of reducing the cost of radio communication and the ability to transfer equipment quickly from one vehicle to another by unskilled personnel.

The Portable/Mobile is the newest product of the manufacturers of the famous Pak-Fone Portable and the powerful Volunteer Communication Receiver, both in wide use in Public Safety Services and in industry.

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More Features Than Mobile Units Costing Half Again As Much!

- Transistorized Power Supply
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- Low Battery Drain
- Attractive Chrome Plated Steel Case

See your local Industrial Radio Dealer or write for complete technical data

INDUSTRIAL ir RADIO CORP.

462 N. Parkside Ave., Chicago 44, Illinois

Do It Yourself Flops

In Denver, Colo., Roy A. Kenney who had a penchant for doing it himself, spent the last five years turning his unfinished basement into a recreation area complete with bedroom and bath.

All in all, it was a creditable job. Only the decorations were lacking and Mr. Kenney attended to that detail, putting on the final paint, June 10.

During the post-painting procedure, Kenney used gasoline to wash the paint from his hands. Some of this was accidentally spilled—and you can guess the rest! The fumes were ignited by a gas heater. The ensuing fire finished up Mr. Kenney's "do-it-yourself-job" for keeps.

Deponent saith not what happened to designer-carpenter-painter Kenney.

Potato Not an Effective Gas Pipe Cap

Howard Williams recently moved from an apartment house in Kansas City, Mo. After disconnecting his kitchen stove he bethought himself of the good (?) old-fashioned way to cap the open gas pipe by using a potato.

The following day he returned to the scene and upon pulling an overhead light chain was caught in the vortex of an explosion which scattered glass and debris for 100 feet and didn't do Mr. Williams any good.

Several tenants were knocked to the floor by the blast but all of the 100 persons who occupy the 17 apartments in the four-story building made their way to safety before the resulting fire could reach them.

Damage to the structure was listed as extensive. Williams was hospitalized for severe burns on the right arm.

Frank H. Gage

Hot Off the Tape

In Glens Falls, N. Y., Fire Captain Ralph Hill was sitting in his living room enjoying relaxation from duty when his fire department radio blared forth, reporting a fire—of all places, in his own backyard. The captain stood not on the order of his going—but got—and had the fire, reported by a daughter who lives next door, out before his pals arrived. . . . We won't mention the name of the city, but this item in an account of a half-million-dollar blaze caught our eye: "The——on Route——was destroyed by a $500,000 fire shortly before 2:00 a.m. today. Firemen kept the flames from reaching a $20,000 liquor supply in the basement of ——adjacent to the main building!". . . . Firemen of Randolph, Mass., were returning to quarters from a fire at Pines Grove

when they spotted two heavy spirals of smoke. They took off for the new fire "toot sweet," to find a large wooden structure fully involved. Acting Chief Anderson called for help and Stoughton, Holbrook, Braintree and Canton, Mass., firemen combined to help save several homes. A 150-foot section of the frame structure burned—loss $50,000. . . . Down Fort Worth way, Mrs. Myrtle Kirbie told police and firemen she got so mad thinking about her farmer husband that she just had to set his haystack on fire. . . . Two new, modern fire trucks at Emery, S. D., lost their first major bout with flames. Fire destroyed the apparatus and the auditorium in which they were housed before the local vamps could get to the scene. . . . Peekskill, N. Y., firemen were called out of a Saturday afternoon, when passers-by in the main stem spotted smoke billowing from a parked truck. Turned out the truck had been fitted out as a mobile blacksmith shop and ye village smith had started a fire in his forge. Firemen under Chief Ulah suggested that the smithy "leave his truck door open in the future."

Foresters Watch Exhibition, Get an Eyeful

Some 200 forestry officials watching an aerial fire fighting demonstration at Baraga, Mich., on May 16 now know exactly what is dropped on a forest fire when this method of extinguishment is used.

The observers became unexpected—and to them, unwelcome—targets when U. S. Forest Service pilot, Milt Nelson of Ely, Minn., miscalculated his drop zone and drenched them with 120 gallons of the paste-like borax derivative and water. They got an eyeful! □□

City and County Combine Fire Alarm Headquarters

The City of Auburn and the County of Cayuga, N. Y., recently combined all of its fire alarm, mutual aid dispatching and civil defense alerting operations within a single office located in Auburn Fire Headquarters.

All box alarms and telephone calls for the city department as well as telephone alarms for Meridian, Aurelius, Owasco, Sennett, Throop, Fleming Fire Districts 1 and 2, and the Village of Cayuga are handled by the dispatchers. In addition, mutual aid calls for the 26 county fire departments are controlled through the center; all are radio-equipped and alerting is by means of selective signalling.

The four dispatchers are county civil service employees and their succession work schedule is two tours 8:00 a.m. to 4:00 p.m.; two tours 4:00 p.m. to 12:00 midnight; two tours 12:00 midnight to 8:00 a.m., followed by 48 hours off.

According to Auburn Chief Luke J. Bergan and County Fire Coordinator Wendell P. Linnenbach, the new dispatching system is working to the complete satisfaction of both the city and the county.

HOSE DRYING ELIMINATED with Super Qua-Flex fire hose

Now there's no need for "stand-by" emergency fire hose in plants, hospitals, and institutions while other hose dries out. Quaker Super Qua-Flex puts an end to tedious, costly hose drying operations—lets you return the hose to service immediately after use, for substantial savings in time and manpower.

Secret is in Super Qua-Flex's 100% "Dacron" jacket. It's wholly unaffected by mildew and sunlight, and with a moisture absorption capacity of only 0.5%, it can't possibly freeze. Use it indoors or out, on rack or reel.

The inside story: Inside Super Qua-Flex, you'll find an extruded neoprene tube, with white neoprene backing. This all-synthetic tubing is oil resistant, slow aging, and will never become brittle, kink, or crack. With it all, Super Qua-Flex is extremely lightweight, flexible, and easy to handle.

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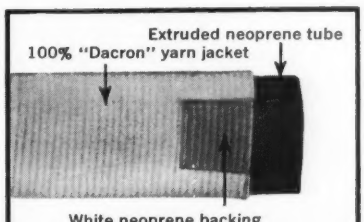

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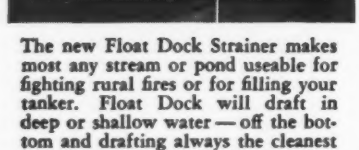
The new Float Dock Strainer makes most any stream or pond useable for fighting rural fires or for filling your tanker. Float Dock will draft in deep or shallow water — off the bottom and drafting always the cleanest water with never a whirlpool or loss of suction at any time. Saves wear on your pump, too.



Strainer drafts just below the surface and down to the last few inches.

WRITE **your distributor or manufacturer for brochure and prices. Specify hose size.**

Manufactured Only By

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A PUBLIC RELATIONS PROGRAM . . .

Continued from page 709

speaking, the volunteer is accepted by the community as a man who is performing a public service without pay and a good deal of risk, but at the same time he is more often the butt of ill-considered jokes.

The type of program outlined in this journal can be followed by volunteers, with some allowance for local conditions. One advantage the volunter organization has is that it has a built-in feature which will simplify and energize the organization and operation of a public relations program. The members of a volunteer department usually include salesmen or merchants or others who are familiar with the technique of selling products or ideas. With the added advantage of being members of the fire department, and cognizant of its aims and problems, they can organize a program which is bound to boost their department with the community.

There are signs that some elements of the fire service are facing up to the problem of how to reach and influence the public. The difficulty encountered in recent years in recruiting personnel has brought about the beginnings of a movement designed to acquaint the public with job opportunities in the fire service.

The International Association of Fire Chiefs has a committe at work on this particular phase of public relations and publicity. At its convention in Miami in 1956, the Association had as one of its speakers a newspaperman who explained the fundamentals of his business and told what the reporter looks for from a fire officer.

In addition, the Association has been broadening its approach to the public. It actively supports the public relations programs of other organizations, companies and communities and it assists in furnishing speakers and films wherever possible to non-fire groups that express an interest in fire service problems and programs. Other organizations which are plugging to improve the status of the fire service are the National Board of Fire Underwriters and the National Fire Protection Association.

The right approach

Obviously there are fire departments which are doing a good job in the field of public relations. Here are just a few examples of excellent public relations ventures by these departments which have helped increase the public's esteem for them. There are many others equally as good we haven't space to detail them.

1. Bringing groups of school children and adults on tours of fire houses, training facilities and alarm bureaus

2. Displaying signs on apparatus being used for apparatus field inspection so that the public knows why the pumper is standing idle on a public street

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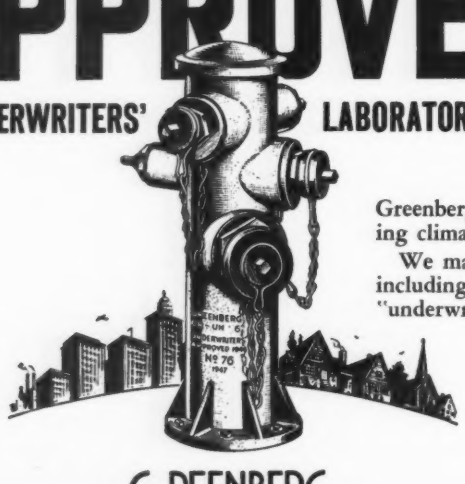

No. 74, 75 and No. 76 California Type Wet Barrel Double Hydrant (for non-freezing climates) offer maximum fire protection. Independent valves for each outlet; integral curved deflector head; full 6¼" waterway throughout hydrant body. Greenberg "Cascade" Dry Barrel hydrants are available for freezing climates.

We manufacture a complete line of fire protection equipment, including fire hydrants, hose valves, standpipe connections, all to "underwriters" standards.

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CALIFORNIA TYPE Independently Valved HYDRANTS

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Offices in Principal Cities throughout the United States

3. Broadcasting each morning over a local radio station the fire department's activities of the past 24 hours

4. California Fire Services Day where all fire department facilities are opened to the public

5. Preparation of comic books to get across the causes of fires; some good fire prevention techniques and the methods of turning in fire alarms

6. Having a counter in the lobby of the City Hall showing the number of alarms responded to by the fire department that day, and the yearly total

7. Sponsoring poster and essay contests in local schools in conjunction with National Fire Prevention Week

The important thing in your public relations program is to begin. One expert in the field who has spent nearly all of his life selling ideas was asked what single suggestion he would offer to launch a sound fire service public relations program. After first getting the objectives and other details on paper in some intelligent form, he suggested an informal—and informative—luncheon which would number as guests, the fire commissioner, the chief of department, the editors and publishers of the local newspapers and owners and program directors of the local radio and television stations and other influential persons.

His point is that a simple meeting of this kind to present an explanation of the fire department's problems and the tentative plans for combating them, combined with a forthright request for the assistance of the press and radio was the simplest and best way to start. But you've got to maintain the momentum—and "there's the rub."

Why not get busy on your own public relations program right now!

Some suggestions

1. Your local library can provide you with a number of good books on basic public relations. Read over some of the material in the field and utilize the experience gained by experts in laying out your program.

2. Check with local colleges and educational institutions. Many offer courses in journalism, community and public relations. They may be able to help train some of your people.

3. Many industrial corporations, government agencies and civic associations have public relations experts on their staffs. If you have no other source of help, ask them for assistance. □□

Exits Chained, 12 Die

A makeshift bus with both exits chained shut caught fire near Soledad, Calif., on June 17 while transporting 50 Mexican nationals to a farm labor camp. Twelve of the workers died in the blaze and 19 others were injured.

BE READY

FOR THAT EMERGENCY!

. . . with the

P-F ®

RK-4 HYDRAULIC RESCUE KIT

Here's everything you need to handle that rescue situation, faster and more efficiently. Actual use at-the-scene for more than four years has proved the P-F RK-4 Hydraulic Rescue Kit the most versatile and practical kit of its kind. Operates independently of outside power sources . . . permits all necessary attachments to be taken wherever a man can go . . . is quickly assembled and simple to operate. The kit you can always depend on when seconds count. Send for illustrated folder today. And ask about PORTER Firemen's Tools for wire cutting and forcible entry.

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HOLDING	OPENING
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PORTER FIREMEN'S TOOLS

Insulated Cutters

Locate and cut wires in darkness and smoke. Co-hardite insulated handles tested to 20,000 volts.

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Cut quickly through hard chain, padlocks, and grilles, using handpower only.

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BUILDERS OF SPECIALIZED RESCUE AND FIRE APPARATUS

GOLD CREST

SAFETY EQUIPMENT CORP.

HIGHWAY 22 P. O. BOX 155
DUNELLEN, NEW JERSEY

HIGH PRESSURE FOG . . .

Continued from page 723

a pressure regulator fitted on the nozzle, designed for decreasing pressures during mop-up and overhaul. The short range operations necessary during the latter stages of a fire seldom require the high pressure blast and the use of this device permits the nozzleman to set the pressure desired at the nozzle without notifying the pump operator.

Further developments have occurred in the pumps themselves and the pump assembly. Prior to and during World War II, the pumps used to supply the 600-psi or greater pressure were either the front-mounted centrifugal or a small piston-type positive displacement. Following the war, several manufacturers introduced pumps which utilized a third stage on a midship pump to achieve the desired high pressure. Another produced high pressures by driving independent impellers of a two-stage pump to the speeds desired.

Today a wide range of high pressure pumps are available for the fire service, including the front-mount, as well as two-stage and four-stage centrifugals which, like the still-popular piston pump, are driven by a power take-off. This latter feature is an attribute because it facilitates pumping while the vehicle is in motion, an advantage in fighting grass and brush fires.

Previously we said that high pressure fog has been in use by city, town, village and fire districts for sufficiently long periods to permit certain definite conclusions being reached. For the most part, the following are excerpts taken from reports of fire departments, fire schools and other sources, made to FIRE ENGINEERING:

1. It is the general concensus of fire officers who can speak from experience that probably the most notable and spectacular advance in the science of fire fighting in recent years has been the development and employment of fog fire fighting equipment.

Also many chiefs believe the blast effect of high pressure, properly applied, assists in the extinguishing action. It is admitted that the higher the pressure—up to the law of diminishing returns—the finer the water fog and the fog droplets. The finer this fog, the more quickly it condenses into steam, called by many "cold steam," with consequent extinguishing effect. The finer the droplets, also, the more they remain suspended in air until they reach the point of conversion.

2. Effectively applied, high pressure water fog attack leaves less run-off. Less water is needed for extinguishment in the first place and less property damage from water ensues. This is a big item in considering salvage.

3. More effective use of water carried on the apparatus is considered an accomplishment of high pressure fire fighting.

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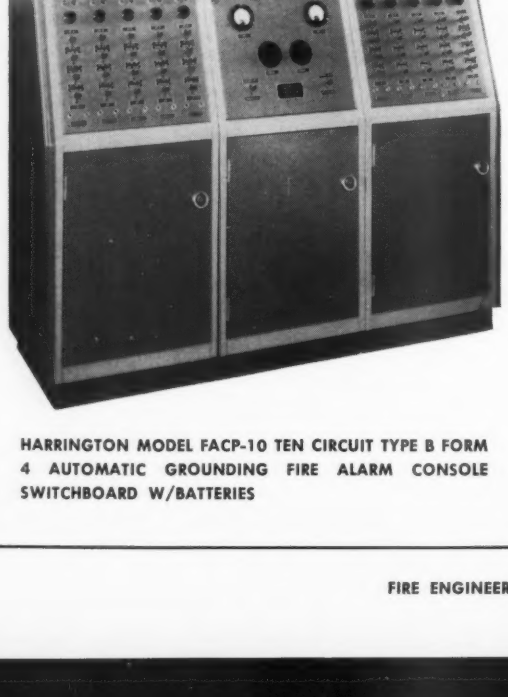

HARRINGTON MODEL FACP-10 TEN CIRCUIT TYPE B FORM 4 AUTOMATIC GROUNDING FIRE ALARM CONSOLE SWITCHBOARD W/BATTERIES

It increases the attack value of the apparatus and theoretically multiplies the fire-killing power of the water carried many times over.

4. There is no set limit to the area of effective fire control using high pressure. There are many imponderables. No standards of extinguishment can be set up because high pressure fire fighting cannot be reduced to simple figures on paper. Experience, however, soon dictates operational procedures to be followed.

5. The ease of controlling rapid changes in stream pattern and the ability of the nozzleman to hold the patterns through fixed changes are desirable attributes, it is claimed by many.

6. The effective range of well-calibrated high pressure fog streams depends upon several factors such as stream elevation, windage, severity of the fire, etc. The modern high pressure nozzle should be able to deliver a stream having sufficient reach to penetrate any room or other area within the average dwelling, store, small warehouse or industrial plant. Many successful users, however, caution against expecting too much stream range, particularly when operating out of doors.

7. Unquestionably, high pressure fog patterns contribute toward greater personnel protection. Here, too, the operating technique employed by the man at the nozzle has much to do with the effectiveness of such protection.

8. Penetration is accomplished, where desired, because of the powerful blast which tends to drive the straight stream and carry the droplets in the fog patterns to the maximum possible distance.

9. Entrained air developed can be blessing or bane. Although some devotees of high pressure claim the blast effect of the entrained air assists in extinguishment, other authorities do not rate the air blast as an asset. On the contrary, they warn against it where (a) the air can stir up powerful dusts and thus invite an explosion; (b) where the power of the air tends to fan the flame and make it burn more brightly and increases the burning area and (c) where the jet-propelled stream may cause harm to personnel during fire fighting operations. Careless operation of the gun nozzle, not the equipment itself, is usually the seat of the trouble.

The entrained air delivered with the high pressure stream has its advantages also. One is in further protecting personnel. The powerful fog stream driving ahead takes contaminated air with it, tending to remove the charged atmosphere and bring in fresh air. It is effective in ventilating but openings should be provided to permit escape of the smoke and fumes driven by the entrained air. Where there may be no suitable vents or other openings for escaping contaminated air, some chiefs insist upon more than a single line in the attack to prevent flames from mushrooming and getting behind the nozzleman.

Please turn page

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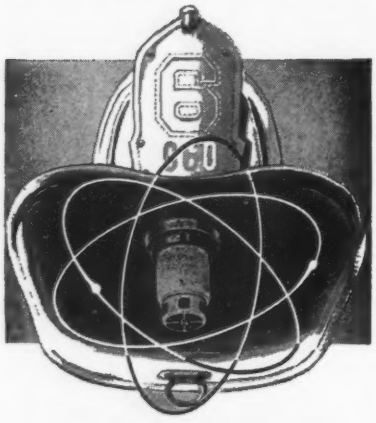

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10. High pressure, although it is effective on nearly all classes of fires, including high tension electrical equipment, is no extinguishing antidote for all types. There are times, such as in large-scale attack and defense, where larger hose and master streams are the only remedy. But, even in very large operations, the high pressure unit carrying 300 to 500 gallons in its tanks, with wet water and foam, can give a material assist in protecting exposures, killing spot fires and covering areas left unprotected.

11. Many fire officers familiar with high pressure operations believe training to be the most important detail in the successful operation of this type of equipment. High pressure fire fighting calls for an entirely new technique if it is to be effective. In the hands of the uninitiated, some high pressure operations can be hazardous.

Fortunately, most of the manufacturers of this equipment school their customers of their products; one company, in fact, maintains an extensive training school, to which pump operators, chauffeurs and even chief officers go for training. This has had a salutory effect on high pressure operations.

12. Finally, cost of equipment, its use, maintenance, measured against its effectiveness in suppressing fires with minimum manpower, places high pressure in the economy class. It is not, as some boast, a one-man fire department. True, under ideal conditions, one man and a high pressure unit can get to work on a fire more quickly and more effectively than any other one-man method of operation. But wherever there are other water supplies available, and there is evidence of any sort of working fire, good judgment says stretch a back-up line. □□

The editors wish to thank all the chiefs and others who contributed toward the foregoing article. Particular thanks are due to these manufacturers of high pressure equipment: John Bean Division, Food Machinery Corp.; W. S. Darley & Co.; Waterous Co.; Hale Fire Pump Co.; Halprin Supply Co.; American LaFrance Corp.; High Fog Pump Co.; American Fire Apparatus Co.

INSTRUMENTS

Continued from page 720

cause a discharge, which is proportional to the strength of the radioactivity and is measured on the calibrated dial. It is more readily controlled for degrees of sensitivity and may be used to more accurately measure the amount of radiation present in a given area. In most Ion chambers the probe proper is integral with the case which contains the power supply, amplifier, circuit meter and controls. Some models provide a remote control chamber which is connected to the case by a cable.

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The use of recently developed materials in our modern world is only in its infancy. As time goes on, more and more scientific discoveries will find applications in medicine, research and industry, and will add new hazards to the ever-increasing complexities of fire fighting. However, there are methods of overcoming these new hazards and the alert fire officer will take advantage of every opportunity of staying abreast of the field.

The instruments described in the foregoing are presently available and are a valuable asset in modern fire department operations. All are self-contained, compact, readily portable and easily carried on apparatus. The measure of protection which they provide against unseen dangers justifies their widespread use. □□

The editors acknowledge the cooperation of the following in supplying information upon which the foregoing was based: Johnson-Williams, Inc.; Mine Safety Appliances Co.; Universal Transistor Products Corp.; Nucleonic Corporation of America; Nuclear-Chicago Corp.; TracerLab, Inc.

CON EDISON

Continued from page 726

not available, it may be necessary to use CO_2 or dry chemical on a deep-seated wood fire of small size or on a fire in electrical apparatus where the metal has become heated. The extinguishing agent may almost instantly knock out the flame, but a few seconds later the stored heat will cause re-ignition. Conserve the extinguishing agent. Take a quick shot, but stop when the flame is extinguished. In a few seconds, when flame again appears, take another shot. Repeat this until the extinguisher is empty. Remember that during that split second while there is no flame, the material is cooling off, and eventually it may be below the ignition temperature.

Fog nozzles

One of the most weighty subjects which the safety man of a company like Con Edison must consider is the application of water on electrical equipment. Use of water fog and fog nozzles is a "must" in the training curriculum (see "Electrical Fires" later on).

Where manpower is limited, the 2½-inch hose with its 1-inch open nozzle should be replaced by 1½-inch lightweight rubber-lined hose with an adjustable fog nozzle. Of course, a 1½-inch hose will not deliver as much water as a 2½-

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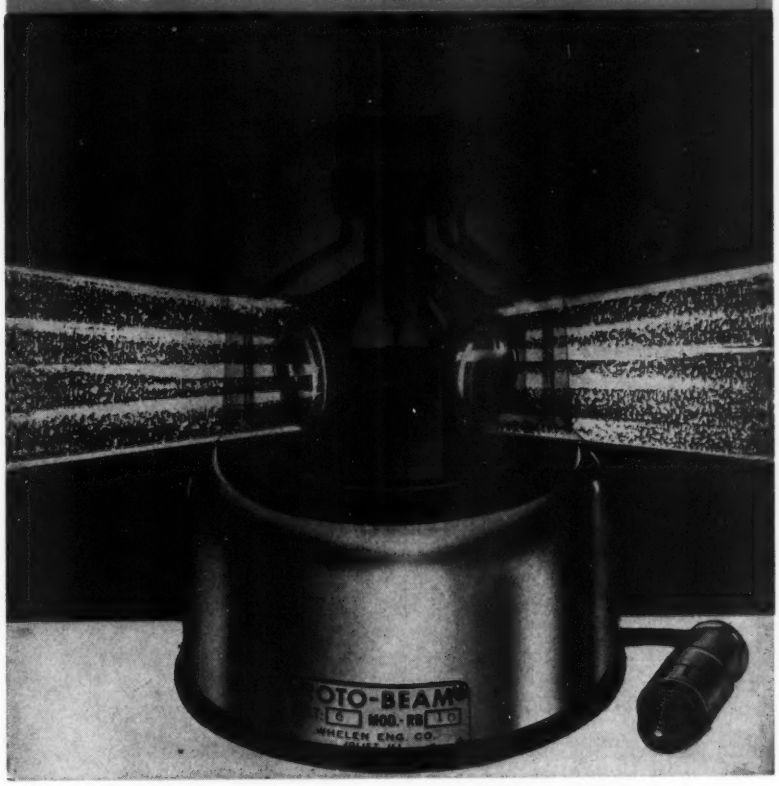

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inch hose, but the fog nozzle will deliver it more effectively. Keep in mind that it is the water that is evaporated that puts out a fire; the water that runs off is wasted.

Let us consider two hose lines, as mentioned above, connected to a standpipe having 70 psi pressure. It is said that only about 10 per cent of the water from a solid stream is evaporated, while about 90 per cent discharged from a fog nozzle is converted into steam.

Hose 100' long	*2½" hose with open nozzle*	*2½" hose with fog nozzle*
Standpipe pressure	70 psi	70 psi
Water delivered by nozzle ...	195 gpm	70 gpm
Solid stream— 10% evaporated	19½ gpm	—
Fog nozzle— 90% evaporated	—	63 gpm
Water run-off (wasted) ...	175½ gpm	7 gpm
Steam produced for smothering	4,290 cfm	13,850 cfm
Btu absorbed in 1 minute ...	181,000 Btu	585,000 Btu

Also, attention is called to the fact that the solid stream cannot be used on a flammable liquid fire, whereas the fog nozzle will extinguish, or at least control, any fire.

If a fire is in a relatively confined area, such as a room of a building and is well advanced so that the air and gas below the ceiling is heated to above 212°, extinguishment may be accomplished quickly from outside the area, and with a minimum of water damage. Open the fog nozzle, then let go of it and hold the hose 4 or 5 feet back from the nozzle. Shove the nozzle into an open window or doorway and aim it *at the ceiling*, not at the flames. The droplets of water coming into contact with the heated air will be instantly evaporated.

A fog nozzle delivering 50 gpm will thus produce up to 11,000 cfm of steam to flood the fire room and adjacent areas, and the evaporation of the fog will absorb up to 465,000 Btu per minute. Remarkable results can be obtained in this manner.

When using the fog nozzle on a large oil fire, adjust the discharge angle as required (60° angle is generally satisfactory), and while at quite a distance from the fire, open the nozzle wide. With one or two men holding the nozzle, move it in a rotary motion so as to produce a wider and higher curtain of fog in the air. This will give the fire fighters greater protection from the heat (even when approaching from the leeward side of the fire) and will extinguish a greater area at the same time. Advance slowly toward the fire.

If two or more hose lines are used on one oil fire, it is better to approach from the same side, otherwise, one party may drive the flames into the faces of the other party.

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Additional men should not think they are helping the nozzle men by holding the hose just back of the nozzle. This takes away from the nozzle men the control of the nozzle by tipping it toward the ground. If you really want to help, hold the hose some 10 to 12 feet back of the nozzle, allowing it to sag to the ground just behind the nozzle men.

Electrical fires

Electrical fires result from excessive heating of the windings, usually as a result of a short circuit or accidental ground. The damage is all done at the instant of the failure, and the equipment will have to be rewound. Therefore, time is not too important in the case of an electrical fire. Wait a few minutes, if necessary, until the power is off, even if you intend using an approved extinguishing agent. CO_2, dry chemical, vaporizing liquid and even water fog can be used safely on live electrical apparatus, but it is better practice to wait until the power is off.

However, in some locations it will be impossible to de-energize nearby apparatus in the same room. Don't intentionally direct water at live equipment, although you can be assured that you will not be shocked if you accidentally wet it. About the worst that can happen is that the water running down an insulator may cause a flash-over which will startle you, and perhaps momentarily blind you.

The real hazard is presented when a fire fighter steps into a puddle of water between a fallen live wire and an electrical ground. Say a 440-volt trolley wire for an overhead crane in a shop has fallen to the floor and lies in water. About 8 feet away, also wet, is a grounded pipe riser or building column, at zero volts potential. Then for each foot of distance between the wire and the pipe the voltage drops more than 50 volts. If a fireman steps into that path of the current, with a 2½-foot stride, he may have a difference of 160 volts between his feet. The current going up one leg, through his body and down the other leg, may kill him. Remember, firemen's boots are not insurance against electrical shock.

Watch out for overhead wires on poles along the street or private road in the plant. In general, the higher the wire position on the pole, the higher the voltage. The size of the wire means nothing, for the 240-volt wires are usually larger in diameter than the 2,300 or 13,200-volt primary wires. However, the larger the insulator, the higher the voltage, but *you can be just as dead if you make good contact with a low voltage wire.*

Tank fires

Under normal conditions, an oil storage tank cannot burn or explode, so long as the roof remains intact. A gasoline storage tank always has a too-rich-to-burn mixture above the liquid, except when being rapidly emptied, or possibly during a sudden thunder shower. A fuel oil tank has a too-lean mixture. Tanks containing chemicals at a temperature

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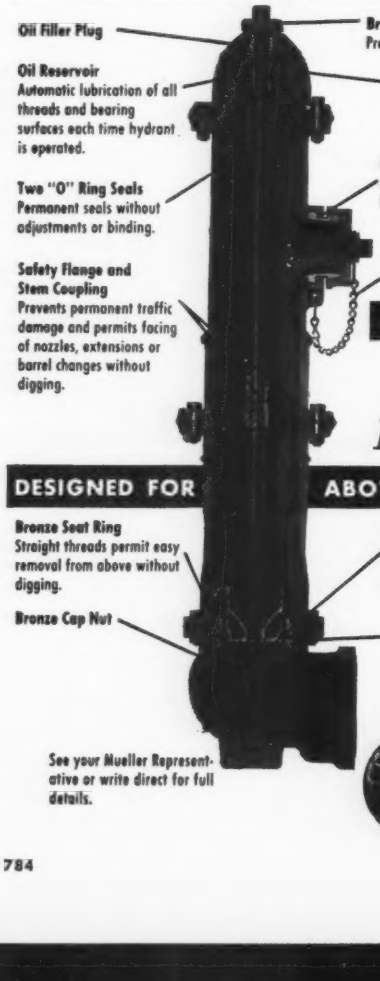
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just above their flash points or when being emptied, are potentially explosive. If a large tank is burning at the vent with a steady yellow flame, there is little, if any, danger of an explosion, and there is no urgent need to extinguish this flame unless it begins to flicker or turn bluish.

Gas fires

In their training in the handling of gas fires, men are taught not to extinguish a gas fire. Allow it to burn until a valve can be closed to stop the flow of gas, but in the meantime use water fog on the flames to absorb much of their heat, and to minimize the damage to adjacent structures and equipment. However, if it is certain that by extinguishing the flame a shut-off valve can then be reached, then and only then should the gas flame be extinguished. But before extinguishment is begun, arrange a means of quickly re-igniting the gas in case the valve has been rendered inoperative. It is better to have a relatively large gas fire that is under control than to have an explosive gas-air mixture enveloping an area, and which may explode with disastrous results if ignition should take place. □□

RESCUE TRAINING

Continued from page 713

to texts and periodicals of various authorities. Prominent among these is "Fire Service Rescue Manual," by Joe Mehaffey, Los Angeles County Fire Department (published by FIRE ENGINEERING).

Supplementing these are manufacturers' bulletins and instruction manuals which explain in detail the operation of important items of equipment designed for specific rescue purposes. A progressive fire department will strive to maintain a reference library for use of its members.

Summary

From the foregoing it is possible to sum up required training for rescue squadmen, as follows:

1. Basic knowledge of the fundamentals of fire fighting

2. Operation of hand and power tools normally used for forcible entry purposes

3. Familiarity with basic building construction practices

4. Dexterity with ropes and rigging

5. First aid supplemented by medical instruction on techniques which are beyond those normally expected of a first-aider, including mechanical resuscitation and oxygen therapy

6. Tunneling, shoring, bridging and related practices in order to understand the problems associated with cave-ins and building collapse

7. Refreshing training to insure retention of less frequently used skills. □□

Persons in the News

White Plains Names Brady

Deputy Chief Raymond J. Brady, a veteran of 31 years in the fire service, has been named chief of the White Plains, N. Y., Fire Department, succeeding Edward J. MacDonald who was recently advanced to the post of commissioner of public safety.

Chief Brady joined the department as a volunteer and was named to the paid department in 1927. He was promoted to lieutenant in 1945, captain in 1955 and deputy chief the same year.

Wisconsin Names Clark

William E. Clark, retired New York Fire Department battalion chief, has been appointed supervisor of fire service training for the State of Wisconsin. He headed the list established after a nationwide civil service examination to fill the post which was created by the 1957 legislature. The training program is under the administration of the Wisconsin State Board of Vocational and Adult Education.

Chief Clark was at one time instructor in fire company administration, Queens College, N. Y. Following his retirement from the New York Fire Department, he served as chief of the Bakellite Company's fire brigade and was curriculum director of the Middlesex and Somerset County, N. J., and Mid-Jersey fire schools.

Hugh Halligan Reinstated

Hugh A. Halligan, colorful, widely popular figure in the fire service, who retired June 19, 1957, from the New York Fire Department as Chief of the 4th Division, was reinstated within a year and assigned to the Marine Division to replace Chief John J. Ryan, forced out under the 65-year age retirement plan now in effect. Chief Halligan is 63.

He was appointed in 1916 at 22 years of age, and rose rapidly through the ranks, becoming a battalion chief in 1929.

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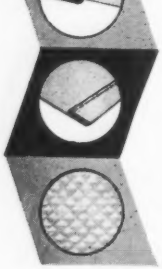

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In 1941 he was appointed deputy fire commissioner; he left that post a year later.

Chief Halligan is perhaps best known outside New York for his invention of the Halligan tool, a sort of claw tool. His return to the Marine Division finds him in the branch of service in which he served as captain of a fireboat.

Lynch Named Fire Marshal

Peter E. Lynch, assistant fire marshal of Nassau County, N. Y., since 1939, was appointed fire marshal on June 14 to succeed the late George Clough.

Marshal Lynch entered the fire service in 1921 as a volunteer member of the Roslyn, N. Y., Hook and Ladder Co. 1 and has continued his affiliation to date; he was foreman of the company in 1937 and is presently a trustee.

He is first vice president of the New York State Association of Fire Chiefs, a member of the New York State Advisory Board, and a Fire Advisory Committee member of the State Building Code Commission.

Gates Goes from Las Vegas To Santa Fe Springs

Elmer Gates, for the last four and a half years with the Las Vegas, Nev., Fire Department, has been appointed chief of the newly created Santa Fe Springs, Calif., Fire Department. He was formerly chief at Santa Ana, Calif., and during World War II, commanded a fireboat in Los Angeles-San Pedro-Long Beach Harbors with the U. S. Coast Guard.

William McDade, assistant chief of the Santa Monica Fire Department has been serving as interim chief for the City of Santa Fe Springs. Fire calls are being answered from three temporary stations in the city until new firehouses are built.

New Chief in Painesville

Captain Eugene Tuthill, an 18-year veteran of the Painesville, Ohio, Fire Department has been named fire chief after topping a civil service examination for the post. He succeeds C. Gordon Smith who recently resigned.

Chief Tuthill joined the Painesville department in 1940 as a volunteer and took permanent status shortly thereafter. He was appointed captain in 1950.

Blohm Retires, Vallad Appointed Detroit Chief

Edward J. Blohm, 65, chief of the Detroit Fire Department, retired July 1 after 47 years service. He joined the department in 1911 as a member of Ladder 2 and later drove the then chief of department until his appointment as lieutenant in 1924. He became a captain in 1930, battalion chief in 1941, assistant chief in 1946, deputy chief in 1949 and was named chief in 1952.

Chief Blohm has helped fight more than 20,000 fires during his career, including

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A tillerman of Chicago Firehouse #6 wearing a Rupert Heavy Duty Belt.

More and more Fire Departments in leading cities are installing Rupert Safety Belts in the tiller seats of all hook and ladders, in the cabs of squad cars, ambulances, chief's cars and the commissioner's car to protect their force from unnecessary injury and death.

Rupert Safety Belts are used exclusively by Chicago, Memphis and Milwaukee Fire Departments to name but a few.

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the disastrous Briggs Manufacturing Co. blaze in 1927. He will reside with his wife at their home at 14138 Edmore Street, Detroit, and has announced no plans for the future other than to travel.

Deputy Chief Raymond Vallad has been named to succeed Blohm as chief of department. For Vallad, 61, a veteran of 41 years service, the appointment was his second major promotion since March 5 when he was named deputy chief.

The Detroit Fire Commission has also announced that Battalion Chief Joseph H. Adler has been named deputy chief, succeeding Vallad.

Reader Picked for President

Louis M. Reader, village trustee of Dobbs Ferry, N. Y., for more than 30 years and active in state, county and local fire service circles, was elected president of the Southern Tier Volunteer Firemens Association of New York at its annual meeting in June. The Tier takes in Long Island and Westchester, N. Y. Reader was guest at the annual firemen's parade in St. James, N. Y., participated in by 65 fire companies.

Chief Hugh Lyon Retires

Fire Chief Hugh F. Lyon, St. Louis, Mo., has announced his retirement, effective August 27, after 44 years of service. He joined the department in 1914, was promoted to lieutenant in 1922, captain in 1930, battalion chief in 1938 and deputy chief in 1950. He was made chief of department in 1955.

Deputy Chief James Sauerwein has been named acting chief pending a civil service examination to select Lyon's successor.

Chief S. F. Walsh Retires

Chief Stephen F. Walsh of the Texarkana, Ark., Fire Department, retired June 1 after 46 years of service. He was appointed a fireman in 1912 and became chief on February 2, 1942.

Yonkers Chief Retires

William C. Garvin, chief of the Yonkers, N. Y., Fire Department for the past 13 years, will retire on August 19, when he reaches the mandatory retirement age of 65. A veteran of 37 years service, Chief Garvin was appointed a fireman on February 15, 1921. He advanced through the ranks until his appointment as chief on January 16, 1945. He is a member of the International Association of Fire Chiefs; the New York Association of Fire Chiefs and other fire service organizations.

Chief Harry T. White Retires

Fire Chief Harry T. White, 62, of the Belleville, N. J., Fire Department, retired on July 1 after 39 years of service in the department.

Chief White became a fireman in 1919

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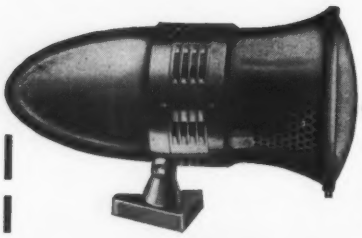

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ASBESTOS — For flames or intense heat.

FIRE RESISTANT DUCK — For arc and spot welding spatter and minor hazards. Specially treated to resist oil, water and mildew.

SYNTHETIC IMPREGNATED DUCK — For water or chemical splash only.

LIGHTWEIGHT 3M ALUMINIZED ASBESTOS OR DUCK — Industry's most efficient heat reflecting fabric.

GARDWELL Salvage Covers & Blankets are made to order in any size — Furnished with Grommets or Hemmed for Hanging.

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as a volunteer and was appointed to the paid department in 1930. He was promoted to lieutenant in 1942, deputy chief in 1948 and chief on September 19, 1954.

He is a member of the International Association of Fire Chiefs, Eastern Association of Fire Chiefs, New England Association of Fire Chiefs and the New Jersey Association of Fire Chiefs. He is also a life member of the Firemen's Mutual Benefit Association and the Belleville Exempt Firemen's Association. □□

Obituaries

Marshal R. M. Tappin

Robert M. Tappin, 71, fire marshal of the State of Massachusetts, died July 18 at Baldwinville Hospital Cottages after a long illness. He had been appointed state fire marshal in 1954.

Marshal Tappin entered the fire service in 1912 as an engineer in the Gardner, Mass., Fire Department. He became a lieutenant in 1913, captain in 1914, and was appointed chief in 1927. He headed the Gardner department for 24 years until his retirement in 1951.

He was a member of the International Association of Fire Chiefs and had served as IAFC state president. He was also a former officer of the New England Association of Fire Chiefs and a past president of the Massachusetts Fire Chiefs Association.

Robert E. Andrews

Robert E. Andrews, 77, former assistant chief engineer of the National Board of Fire Underwriters died July 29 following an illness of two years. He was a resident of Berkeley, Calif.

A civil engineering graduate of the University of Michigan in 1905, he worked several years for the Board of Water Commissioners, Detroit, and joined the National Board in 1911. During World War I, he was loaned to the Federal Government in the Bureau of Yards and Docks. Upon his return to the NBFU, he was assigned to the San Francisco office as assistant chief engineer. He retired in October 1946. □□

Tokyo Has Water Troubles

Tokyo firemen stood helplessly by on June 26 last, unable to get water on a fire that burned 19 houses, because of low water pressure.

It was reported that 70 per cent of Tokyo's hydrants are useless as a result of the area being hit by the worst drought in 52 years.

The city has ordered drastic water rationing. Beginning July 1, water will be supplied only two hours a day to parts of the city and pressure will be cut throughout Tokyo.

Tokyo has had only 2.4 inches of rain in June compared with a normal June average of 7.06 inches.

ANNUAL REPORTS

Austin, Tex.—Chief J. E. Woody reports losses of $236,000 for 1957, a decrease of $515,000 over the previous year.

Milwaukee, Wis.—Chief Edward E. Wischer reports losses of $2,760,840 for 1957. A significant increase in fires of incendiary origin was noted during the year.

Colorado Springs, Colo.—Chief Fred H. Lausch reports losses of $53,444 for 1957, a decrease of more than $400,000 over 1956.

Salt Lake City, Utah—Chief J. K. Piercey reports losses of $465,696 for 1957, a slight increase over 1956. The department extinguished 2,024 fires during the period, highest total in its history.

Dayton, Ohio—Chief Forrest B. Lucas reports losses of $257,000 for 1957, a reduction of $309,000 over 1956.

Columbia, S. C.—Chief A. McC. Marsh reports losses of $258,355 for the fiscal year 1956-1957, a decrease of 60 per cent over the previous year.

Long Beach, Calif.—Chief Frank S. Sandeman reports losses of $639,501 for the fiscal year 1956-1957, a decrease of 22 per cent over the previous year.

Hammond, Ind. — Chief Edward J. Spolnik reports losses of $102,229 for 1957. Two fires accounted for more than 50 per cent of this total.

Lima, Ohio—Chief Walter L. Hydaker reports losses of $679,715 during 1957. A total of 487 alarms were answered.

Leicester, U. K.—Chief Fire Officer Errington McKinnell, O.B.E., M. I. Fire E., reports a toal of 1,839 fire calls during 1956. Street fire alarm boxes were eliminated during 1955 and malicious false alarms recorded were 42 as against 66 for the previous year.

British Columbia—Provincial Fire Marshal Basil Nixon reports a 41 per cent increase in fire losses to $15,308,745 during 1956. Of the 7,838 fires, 2,935 were caused by careless smoking.

Atlantic City, N. J.—Chief Zenus Mathis reports a total of 708 fires with losses of $1,249,161 in 1957.

Tulsa, Okla.—Chief G. L. Sartain reports losses of $549,282 for 1957. This represents a decrease of 54 per cent over 1956. Fires reported were down 31 per cent over the previous report.

Hayward, Calif.—Chief Matthew Jimenez reports losses of $210,816 for the fiscal year 1956-57, an increase of $130,000 over the previous period.

Oakland, Calif. — Chief James J. Sweeney, Jr. reports losses of $1,897,199

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Cools • smothers • kills fires before they spread

CHAMPION PISTON-TYPE PUMP

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By breaking water up into a fog-spray under pressure, the Champion Slide-Action Fire Pump cools burning substances, smothers the fire—*makes a little water do a big fire-fighting job.* Powerful slide-action pump is brass throughout with non-corroding, self-cleaning ball valves. The brass nozzle adjusts from fog-spray to 30-ft. stream by merely rotating nozzle cap. 4-ft. hose attached at top prevents water from running out when pump is below bottom of tank. Large filler opening has leak-proof cover with carrying handle and locking device to hold pump when not in use. Ventilated back of Champion design keeps operator's back dry and cool. Quality-built by a manufacturer of dependable spraying equipment since 1915.

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DUMP VALVE

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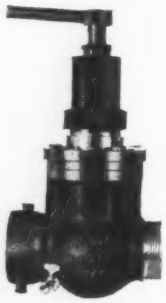

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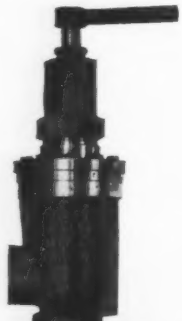

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for pressures up to 800 psi relieving from pump discharge to suction

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for the fiscal year ending June 30, 1957, a decrease of $88,000 over the previous year.

Rockford, Ill.—Chief Wayne E. Swanson reports 1957 losses of $161,930, a decrease of $913,000 over 1956.

Waterloo, Iowa—Chief Ray Tiller reports losses of $232,740 for 1957. The number of alarms answered were slightly less than the previous year, but losses were up $156,000 over 1956.

Cedar Rapids, Iowa—Chief Jesse G. Hunter reports losses of $102,915 for 1957. This is the lowest total in the past eight years.

Wichita, Kans.—Chief F. E. Wood reports a reduction of $400,000 over the previous year. Losses for 1957 were $653,72.

Montgomery County, Md.—Fire Marshal Charles H. Howe, Jr. reports losses of $659,049 for 1957, an increase of $1,700 over 1956.

Hamilton, Ohio—Chief George Schlotterbeck reports losses of $68,850 for 1957, a decrease of $44,000 over 1956.

Lubbock, Tex.—Chief Glenn W. Smith reports 1957 losses of $200,185 showed a decrease of more than $500,000 over 1956.

West Milwaukee, Wis.—Chief John Pavilk reports losses of $2,193 for 1957, a reduction of $123,000 over 1956.

Akron, Ohio—Chief G. F. Vernotzy reports losses of $1,929,528 for 1957, an increase of more than $1,200,000 over the previous year.

New Haven, Conn.—Chief Thomas J. Collins reports losses of $842,866 during 1957. He recommended consideration of a fireboat, extension of radio-control of traffic lights to all signals in the city and a long-range plan for replacement of overage fire stations.

Reading, Mass.—Chief Hugh L. Eames reports losses of $172,936 for 1957. He recommended extension of the fire alarm system, consideration of purchase of a junior aerial ladder and additional paid manpower.

Sydney, N. S. W., Australia—Acting Chief Officer H. W. Pye reports 13,516 alarms for Sydney and its suburbs and 6,444 calls in the country districts during 1956.

Springfield, Ohio—Chief Willard G. Compton reports losses of $61,835 during 1957, a reduction of $167,000 over the previous year.

Dominion of Canada—Fire Commissioner C. A. Thomson, Fire Prevention Branch, Department of Public Works, reported 88,744 fires and 601 deaths from fire during 1956. Losses for the country amounted to $106,772,153. □□

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- **Increases effectiveness of water**
- **Less water is required**
- **Less extinguishing time**
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- **Provides quicker, easier handling of deep seated fires**
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WET WATER CARTRIDGES

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Makes every gal. do the work of 5. Each FIRE-LIK cartridge makes 1000 gals. fire fighting solution. Multi-phase. Odorless. Non-Toxic. Stainless. Non-Corrosive. Carton of 12 .. **$60.00**

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No pumps, motors or storage tanks needed. No more booster tank damage. Proved in use by fire departments and industrial concerns.

#200P—Portable **$95.00**
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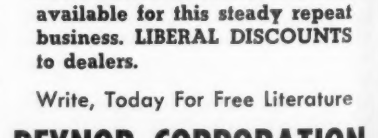
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Questons and Answers

Use of Soft Suction

To the Editor:

In some cities hard suction is used for connecting the first due pumper to a hydrant because of a belief that soft suction is not reliable where low pressures are expected. Is this fear justified? R. G.

Answer: Tests have shown that little additional water can be obtained by drawing a vacuum on a hydrant and that the use of hard suction is more a matter of preference than efficiency.

Large bore soft suction has much to recommend it. It is easier and faster to hook up and acts as a sort of safety device, and will collapse when the pump operator attempts to exceed the discharge of the hydrant. The maximum amount of water available will be obtained at the point just before the hose collapses; an expert pump operator will maintain a pressure which takes advantage of this feature.

Hose Damage by Vehicles

To the Editor:

Two lines of hose are laid across a street, one line being dry and the other charged under pressure. If vehicles are allowed to pass over both which line would suffer the least damage? B. C.

Answer: We believe that the dry hose will suffer most.

According to a large manufacturer the action involved is as follows:

1. In an uncharged line if the wheels traverse the hose, the normal action is for the hose to ball up and rotate ahead of the wheel. This causes the tube to delaminate from the hose jacket.

2. In a charged line, since water is relatively incompressible, the action of the wheels rotating forward is normally to rise above the hose. A condition similar to this would be driving over a log or a rigid round object.

We believe this clearly explains the action involved.

The question does not state whether or not the hose is crossed at or close to the coupling. It is generally agreed that whether empty or charged, hose damage is greater when it is crossed at or close to the coupling. □□

Purdue Industrial Conference a Success

The fifth annual Industrial Fire Control Conference held at Purdue University, June 4 to 6, was attended by over 100 safety heads from Wisconsin, Ohio, Kentucky, Michigan and Indiana companies.

In addition to participating in fire fighting demonstrations, the conference was addressed by outstanding insurance and industrial safety authorities.

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Don't risk missing alarms.
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Be alerted the modern way.

Volunteers!!

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Transmits location and progress of fire.
(Especially designed for Fire Calls)

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Specify EXACT frequency

- DRIFT-FREE
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HALPRIN SUPPLY CO.
1355 South Flower St., Los Angeles 15, Calif.

FIRE APPAREL

Continued from page 734

water over the inside surfaces. Anti-fogging agents are also available for goggles that cannot be ventilated.

Special filter lenses should be used to screen out irritating color lines in the visible spectrum. Plastic lenses are easily scratched but offer the advantage of not breaking. Accepted standards are provided by Federal specifications to make sure that safety glass lenses have good optical qualities.

The eyes and face can be protected from chemicals, dust, falling objects, liquids, etc. by the use of an inexpensive faceshield. These are made of cellulose acetate for small particle impact, or polyvinylchloride acetate for resistance to chemicals. The face shield is held in place by an elastic headband or can be attached to a rigid type headgear. Colored cellulose acetates can be used to filter harmful quantities of ultraviolet rays.

Belts

While a dress belt may not be considered protective clothing, it has many uses. It may be used as a tourniquet to stop the flow of blood; attached to a claw tool it permits breaking windows on the floor below for ventilation. The belt can be used to fasten the right knee to the right wrist of an unconscious person for the fireman's carry, thus permitting the use of both hands by the rescuer for going up or down ladders, etc.

Work belts worn over waterproof coats are longer, stronger and have many more uses. Some belts have rings which can be used for life saving and other purposes. These belts permit various tools and pieces of equipment to be carried, i.e. spanner, flashlight, rope, combination axe and jimmy, first aid, etc. Many departments find other applications for these belts in fighting fires and rescue.

Summary

All these items of protective clothing have been available for many years, but unfortunately, many of us neglect to use them, and the proof of this is seen in our high injury rate. Pick up the annual report of injuries and analyze the causes of injuries such as falls, falling objects, sprains and strains, cuts by glass and metal, burns, nails, etc. A great many of these injuries which have caused disabilities and deaths could have been avoided. Our haste to save a life frequently causes us to lose our own because we fail to wear proper protective clothing.

Tradition and fear of being called a "sissy" has kept many firemen from utilizing gloves, goggles, face shields and heat-resistant suits which have been available for many years in the fire department. Private industry would never permit this attitude which leads to high accident and injury tolls, and neither should the fire department. Officers should insist that proper protective clothing be available and used. Responsibility should be fixed to see that there are no deviations.

Frequently management is at fault by failing to supply protective clothing, or an allowance to purchase equipment. This false economy frequently forces firemen to use old discarded clothing for fire fighting which requires specialized clothing for optimum protection and efficiency.

Management could do a better job of selling the importance of using protective clothing by appealing to the emotions instead of reasoning power alone. A collection of safety goggles can be procured from manufacturers showing how they have actually stopped molten metal and other flying objects and have saved their wearers from losing their eyesight.

The best way to emphasize the importance of faculties which we take for granted would be to blindfold each member for a period of time and have them try to eat, identify objects by sense of touch, dress and undress, find their way about, etc. These demonstrations may start out as a game but they will impress the importance of using proper protective clothing and the men will gladly use the clothing and suggest improvements in the future.

Thus management should take the initiative to reduce injuries by encouraging the adoption of a safety code; supplying protective clothing; and fixing responsibility for its use; educating and selling the benefits to all members, and encouraging enthusiasm by holding intercompany safety contests with awards being publicized to encourage participation by all members. Fire prevention activities have cut down fire losses. The fire service should stress accident prevention which will cut down accident losses in its own field. □□

Book Shelf

FAMOUS FIRES, *by Bruce Clevely, published by the John Day Co., 62 West 45th Street, New York 17, N. Y.; 186 pages; price $3.50.*

The author describes 25 fires which have resulted in disastrous loss of life and property, and which "never should have happened." In an introduction, he tells what to do in the event of fire and suggests measures to prevent fires from getting started. While not too technical, the book is factual and interesting and is a good contribution to the literature of the fire service.

RESEARCH ON FIRE, *edited by Horatio Bond, published by the National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass.; 184 pages; price $5.00.*

This is a report describing the facilities, personnel and management of some of the agencies engaged in research on fire. Although not intended as a history, the text gives important dates and developments of fire research, including structural as-

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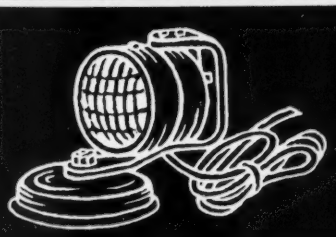

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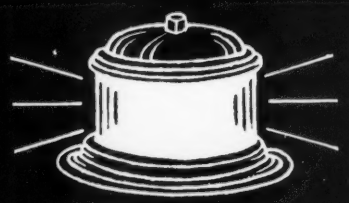

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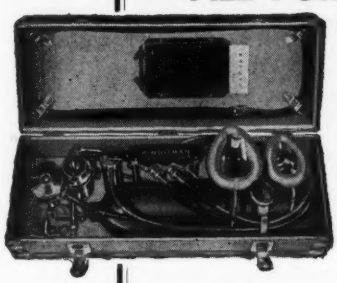

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The WX-10 weighs 150 pounds.

Pressure	50	100	150	200	225	250
Gals. per min.	40	38	37	36	35	32

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FIRE EQUIPMENT DIVISION

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semblies, measurement of flame spread on wall finishes, automatic sprinklers, combustibility of fabrics, etc. Included, also, are data on foreign fire research organizations and accomplishments.

HOW TO RECRUIT POLICEMEN AND FIREMEN, *by Robert W. Coppock and Barbara Brattin Coppock. Personnel Report No. 581, published by Public Personnel Association, 1313 East 60th Street, Chicago 37, Ill.; 64 pages; price $5.00.*

The publication contains chapters on planning the personnel selection program; recruiting, testing and ranking applicants; checking on applicants; and an appendix of exhibits. In a day and age when it is becoming more difficult to locate, select and enroll eligibles for the fireman's job, it should prove invaluable. □□

NY Buffs Produce Movie

A 30-minute color film titled "FDNY" (Fire Department New York) has been produced by a group of New York fire buffs as a contribution to public education. Designed to acquaint the general public with the work of New York firemen, it will be shown on television and to school and civic groups.

The movie is introduced by Commissioner Edward F. Cavanagh, Jr., and takes the viewer on a tour of an average day in the life of a fireman.

It graphically depicts the training of a probie, response to alarms, studying for exams, fire prevention inspections and the hazards of fighting fires.

The movie was the result of an idea by Ted Green, *Radio and Television Daily* columnist, and Ira Marion, ABC TV and radio script writer, who also wrote the script for the film. Herman W. Kitchen, film director for Metropolitan Educational Television Association, was cameraman, assisted by Ray Hellriegel, lieuten-

Buffs filming Greenpoint lumber yard fire for sequence used in new fire department movie are (l. to r.) Ira Marion, director; Herman W. Kitchen, cameraman; and Sig Morgenstern, editor—*Photo by Ted Green*

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ant in charge, NYFD photo unit. Editing was in charge of Sig Morganstern, supervising film editor, NBC film Center.

Tax monies were not required in the production. Commissioner Cavanagh and Fireman Howard Barry, then president of the Uniformed Firemen's Association, secured funds from the Firemen's Welfare Fund to pay for film and laboratory processing. It is estimated the final cost of the 32 minute film will be slightly over $3,000. According to the buffs, who are business professionals, it would have cost in the neighborhood of $50,000 to have the film made for commercial purposes.

Swimming Pool Serves as Pumper Testing Pit

Vernon, Calif., firemen have an unusual pumper testing pit located in back of Station No. 2. It is a 20 by 40-foot swimming pool with 28,000-gallon capacity. A suction sump is adjacent to the pool and apparatus pumping discharges back into the reservoir.

Vernon Chief L. C. Husted says that the northeast end of the pool is closed off by an accordian-type partition and the diving board removed for testing purposes. More than 50 pieces of apparatus have been tested at the pit since it was built last year—including 12 new pumpers for the City of Los Angeles. Ten of the 12 were tested in two days.

Vernon firemen and other municipal employees of the community use the pool. On-duty firemen are allowed to swim—they leave their turnouts nearby. Yes, the boys have answered alarms while in swimming.

Cliff Dektar

Vernon Fire Department's testing pit and swimming pool located behind Station 2. Six new pumpers for the Los Angeles City Fire Department are shown being tested

—Vernon F. D. photo by R. C. Zindel

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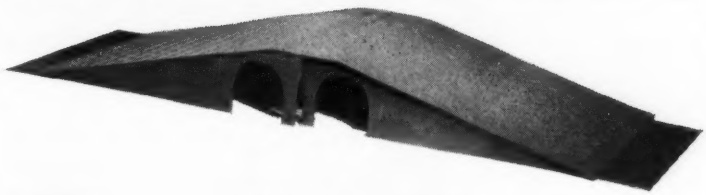

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- **Non-creeping pad**
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Our Readers Write Us

Tributes to Dick Vernor

To the Editor:

I have noted your editorial entitled "Wanted—More Dick Vernors!" in the July issue and certainly we in the Western Actuarial Bureau can echo your tributes as well as your use of his example to highlight the continuing need for leadership in fire prevention and fire protection.

It was Dick's energy and genius for inspiring the best out of everyone with whom he was associated that contributed so greatly to the success of the FDIC. On the other hand, he always maintained in our conversations that it was the cooperation and teamwork that built it to its present size and effectiveness.

You raise a question in a way as to the continuation on the Conference or on the interest of our Fire Prevention Department in maintaining its sponsorship along with the Memphis Fire Department. I can assure you that there is no such possibility for our companies feel that the work of our Fire Prevention Department should go forward and that the FDIC is one of the most important avenues in which our business can help contribute direction and growth to the fire service. We will have to replace Dick, but in the meantime Emmett Cox is fully familiar with what is needed to start planning for next year along with Chief Klinck and he has our full support in making such initial steps for the planning of the Conference as are necessary.

I agree with your thought; namely that this coming meeting at Memphis will be a very fitting tribute to Dick's organization and to all those who have always made such outstanding contributions to its success.

Kent Parker
Manager
Western Actuarial Bureau
Chicago, Ill.

To the Editor:

Your editorial, "Wanted—More Dick Vernors," certainly has my endorsement and approval in the fullest measure. The sentiments you expressed regarding Dick personally, and the need in the country today for true leaders in our fire service is apparent on all sides. My sentiments in this regard you know fully.

It has been my pleasure to know Dick only a few years, and during this time, he has passed on to me some richnesses that I did not enjoy before. I am quite sure that the same is true of his many other friends.

It would be a wonderful thing to set up something in the form of a scholarship, or some other worthwhile undertaking, to serve as a constant reminder of his achievements in the fire service.

May I say to you that, in this respect, I would want to assure you of my personal desire to put forth every effort that

I can and to this end, I pledge my fullest support.

These are critical times in which we live and work and play, and leadership must be found, in my opinion, more in persons who are not professional fire fighters; it behooves us to get others to carry on in the tradition that our departed friend expressed so well.

Joseph P. Sestric
Director of Public Safety
Saint Louis, Mo.

Special Purpose Salvage Covers

To the Editor:

I have been engaged in salvage work for over 25 years. During that time I guess I have operated on about every type of fire and occupancy in the book. If there are any salvage "tools" I haven't used, it's because we didn't have them in our patrol.

Naturally, the most useful of all these tools was the regulation treated tarpaulin or cover. It was—and still is—the greatest product for preventing property damage in the salvageman's kit. And it has a lot of other uses which I needn't detail at this time.

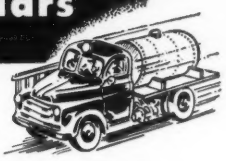
With all its advantages, however, the treated cover (that is, the type generally adopted and used for so many years by all the fire patrols and squads) has its drawbacks—perhaps I should call them limitations—for certain uses and applications. Among these I might mention (1) weight—it is heavy; (2) unwieldy—it bulks large and takes up considerable room; (3) susceptible to dirt and discoloration and stickiness (under heat)—it isn't easy to clean after some applications.

Of course, balanced against advantages, these limitations may not seem so important. However, under certain conditions, they are annoying to say the least. Take occupancies such as drug, variety, jewelry, china, lamp and similar retail stores where you have counters and fixtures loaded with costly stuff. The treated covers can't be applied until and unless you've prepared the way for them, that is, unless you don't care what happens to the displays when you spread the covers. And this extra work of clearing the way for covers takes time and effort, particularly when squads are shorthanded, as they are now.

Then there are other conditions, such as when you respond to a sprinkler leak on the top floor of a tall building and there is no elevator available at that hour of the night. Times like these when we had to lug the old covers up a dozen flights of stairs I wished I was somewhere else, or had a lighter kind of cover, particularly when all we needed was almost any old kind of waterproof sheet for limited protection against sprinkler discharge.

Now, what I want to know is this: Is there any reason why covers can't be made out of some of these modern, lightweight but tough waterproof and acidproof plastics, or other materials which are so widely used? These could be carried on our salvage rigs along with the old regulation tarps' so that we might ad-

Build your own fire truck for a few hundred dollars



The time has come when rural fire protection should leave the "Fancy Dan" class so that every small community can do a real down-to-earth job of extinguishing fires rapidly, simply and inexpensively.

The nickel plate, red paint, gadgets and polish are good if you can afford them. But all you need for sound, economical fire protection is an Oberdorfer All Bronze Pump hooked up to the transmission of a dependable truck that carries a tank of water loaded with a good wetting agent.

Effective fire control starts just as soon as this outfit can reach its destination and a man can grab the nozzle end of the booster hose and get to the fire. The resulting penetrating stream of over 120 lbs. pressure is the fastest and most important phase of fire fighting.

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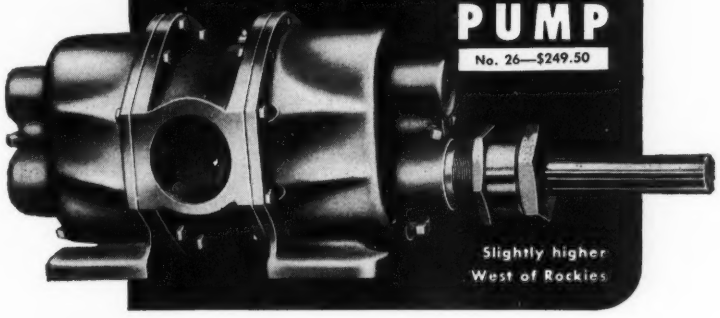

PERFORMANCE DATA—No. 26 PUMP SHOWN ABOVE

Pump Shaft R.P.M.	Pounds Pressure	Hose Length and Size	Dry Suction Lift in Feet	Vol. in Gal. Per Minute
1600	120	500'—1½"	20'	150

For complete specifications of this and other Oberdorfer All Bronze Booster Pumps, and name of your nearest distributor, write:

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These reliable low cost Fairbanks-Morse standby generators are available in five capacities from 600 to 2500 watts. 115 volts, 60-cycle A.C., with manual starting. For complete specifications, write Fairbanks, Morse & Co., 600 South Michigan Avenue, Chicago 5, Illinois.

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just the kind of cover to the kind of salvage job that must be done.

Fire departments have different size hose and various kinds of nozzles and extinguishers for different extinguishing purposes. Is there any reason why our salvage rigs shouldn't carry different kinds of covers for different kinds of salvage jobs?

Some time ago I read in FIRE ENGINEERING about a new cover (I believe it was plastic) that was very light in weight yet would shed water well and in addition, was transparent. It seems to me that with salvage squads so short-handed today—men having to work alone in many cases—this type of cover would be particularly useful for dwellings and occupancies such as I mentioned before, where you have got to be careful how you throw and spread covers.

Don't get me wrong. Of course, I would not for a minute be without the tough, sturdy, heavier, regulation-type covers for the real serious working fires and for exterior protection when it's needed. But I am just wondering why it is that some of our good old cover manufacturers haven't introduced something more in line with the times? Or have they done so, and I have missed hearing about it?

Editor's Note: The above letter comes from a retired salvage corpsman. The ideas expressed are his own and do not necessarily represent those of the author of the series on salvage which appeared in FIRE ENGINEERING, *or the publishers. By request the author's name is withheld.*

Is Work Week 56 or 60 Hours?

To the Editor:

That is an interesting article in your April FIRE ENGINEERING, "Santa Monica Institutes 60-hour Work Week."

Are you not aware:

The three-platoon, 24 hours on and 48 hours off, is in reality a 56-hour week?

The 56-hour schedule indicates the fire department is overmanned, costing the taxpayers more than $20,000 a year, $4\times78\times52\times\$1.50=\$24,000$ plus?

In a genuine 60-hour work week the fireman works 120 hours every two weeks, two 24-hour tours one week and three 24-hour tours the next.

Are all the "improvements" rationalizations to cover up the deceit?

Sam Silverman
Miami, Fla.

Editors Note: Correspondent Silverman apparently did not read the most important paragraph in Chief C. N. Carrell's interesting article and thus missed his point. After explaining the schedule, the chief pointed out how each Santa Monica fireman makes up the additional time required for a 60-hour week. During this period a work week might average 84 hours per man and requires nine extra tours to make up the four hours per week owed the city.

A very important factor, which is quickly evident to experienced administrators, is that the system permits simple adjustment for sick leave, vacations, etc., as

Chief Carrell states. The latter feature will no doubt be looked upon by rating engineers with favor.

Most work schedules are so rigid that a day lost by one man leaves a shortage in some company of the department, a situation looked upon with disfavor by the Underwriters. For the same reason many departments stretch their vacation schedules over the entire year with consequent morale problems.

There is no such thing as a "genuine" work week for firemen. Fire department manning schedules vary according to local conditions and preferences: all are based on averages, as is Mr. Silverman's.

As long as the municipality receives service due according to the legal regulations it matters very little whether the average work week is based upon the hours in a single day, week, month or year. Chief Carrell points out that 131 tours of 24 hours each are required per year in Santa, Monica.

We fail to note any "deceit" in the schedule but rather feel it is an excellent system which helps solve several vexing problems facing a fire administrator.

FE Assists Volunteers

To The Editor:

FIRE ENGINEERING is read not only by myself but also by most of the 50-member fire crew of the Hershey Volunteer Fire Company. It is passed around as soon as I have finished reading it.

Your August "Buyers Guide" issue has been invaluable to our company. We have a new rescue truck on order and your article on "Making Mechanization Do It" has been a big help to us in equipping it. It has given us many ideas and also the advertisements in this issue have furnished us with a supplier for the needed items.

Robert K. Raffensperger
Recording Secretary
Hershey, Pa. Volunteer Fire Co.

Likes Col. de Moura's Formula: Offers a Parellel

To the Editor:

The general equation for finding the vertical range of streams advanced in the April FIRE ENGINEERING by our compatriot from South America was of considerable interest to me. Many of the equations employed by men like myself who instruct in hydraulics are somewhat cumbersome to teach and memorize, and a simple and direct method such as Colonel de Moura's is welcome.

For my own classes, I developed the following equation for computing maximum effective horizontal range and am forwarding it in the hope that it may be of some interest. It gives results identical to the common method of computing for a ¾-inch tip and adjusting from that point.

$S = 40 \times D + \frac{1}{2}$ N. P. $- 4$, where:

S = horizontal range of stream in feet
D = nozzle diameter in inches
N. P. = nozzle pressure

Example: The effective horizontal

From one chief to another . . .

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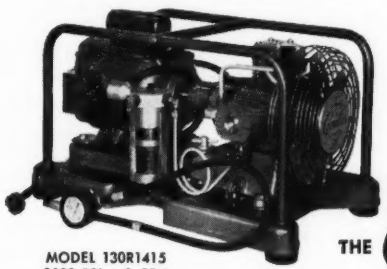
Chief Cawker reports: *"The City of Topeka moved to replace canister type masks with pure air masks in May, 1952. When the change-over was completed we solved the problem of a dependable supply of compressed air through the acquisition of a Cornelius Model 130R1415 high pressure air compressor. This cleared up any uncertainty of an adequate supply of clean air. This compressor is a valuable asset to any fire department."*



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Weight complete — 95 lbs.

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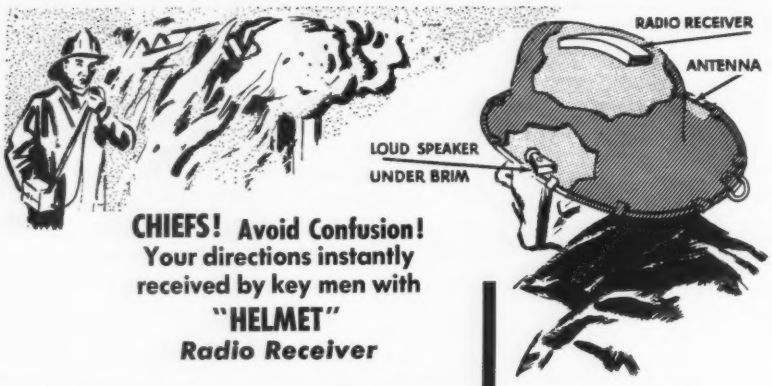

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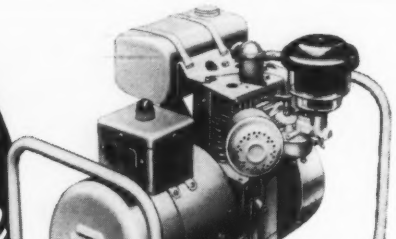

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$$S=\frac{80+26-(5\times6)}{2}$$

$S=40+26+30$
$S=96$ feet

(b) $$S=\frac{40\times1.5+80-4}{2}$$

$S=60+40-4$
$S=96$

Lieutenant C. A. Anderson
Division of Fire
Miami, Fla.

Nike Fire Correction

To the Editor:

I was very much interested in your report of the explosion and resulting fire at the Nike Base at Middletown, N. J., as it appeared in the July issue of FIRE ENGINEERING.

However, I feel your report was incomplete as it failed to give an account of the fire fighting operations of other fire departments participating in the control and final extinguishment of this fire.

Information available to me indicates that the U. S. Naval Ammunition Depot Earle was the first department on the scene. Since there was no public water supply immediately available, the Earle Fire Department supplied two 3,200-gallon tankers to provide the necessary water to extinguish the fire. Other Earle units were present as well as Army fire units from Fort Hancock which took part in the fire fighting operations.

The Nike Base is on government property with the only entrance accessible from the U. S. Naval depot. In view of this, I think the implication in your report that this was a Middletown Township fire is erroneous. There is no doubt in my mind that your account as it concerns the Middletown Fire Department is correct.

I know that the Naval Depot is a good neighbor and cooperates fully with the neighboring communities. It seems unfair that the men of the Earle Fire Department who performed so well in face of the hazards involved were not included in your report.

Henry K. Currie, Ex-Chief
Keyport, N. J.

Editor's Note: FIRE ENGINEERING is grateful to Chief Currie for calling this inadvertent omission to its attention.

Color Code Quirk

To the Editor:

The following concerns a situation we were confronted with at a recent brush fire.

Upon arriving at the scene the assistant chief ordered brooms and back-pack pump tanks to be used on the fire. After the men had the tanks mounted on their backs one man complained that it re-

Low-cost

No one can place a price on the possible loss of lives or properties due to fire. But Falcon Automatic Fire Detectors can give early warning of fire to protect these values—and at costs so low in comparison to other types of fire protection that it must not be overlooked.

Falcon Automatic Fire Detectors are:

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Individual units, through wall extensions, and systems available for manual testing operations in addition to immediate automatic activation.

Avoid Tragedy NOW!

Write for details to:

Falcon Alarm Co., Inc.
243 Broad St., Summit, New Jersey

quired great effort to produce a stream. At the time a small dent was noted on the back of the tank. The fireman denied having fallen or scraped the tank against another object and went about his task.

As the men were returning to the apparatus following complete extinguishment, it was discovered that the bothersome tank had practically collapsed. In searching for the solution to this mystifying situation it was noted that the vent hole in the tank had been painted over.

The tank was a new one and when issued to the company concerned was immediately painted with the proper color code for identification. The job was done so well that the vent was plugged. Consequently the fireman who operated it at the brush fire created a greater vacuum with each succeeding stroke until the tank finally collapsed.

We pass this information along to you in the hope that other departments may be warned to check the vents on their tanks to prevent collapse and at the same time make the fireman's job somewhat easier.

Sincerely,
Robert P. Anderson, Chief
Croton-on-Hudson, N. Y.

Report from Barbados

To the Editor:

Your readers may be interested in the following details of the Barbados Fire Service. The island has an area of 166 square miles with a population of 230,000. We have three fire stations including one at the airport; seven fire appliances and 60 men. In addition, two new stations are under construction and six new appliances are now on order.

During 1956 the department answered 310 fire calls and up to May 26 of this year we have answered 373 alarms. Our special services includes the rescue of people and animals which fall into wells —a peculiar hazard.

The most recent rescue case was a 55-year-old man who had fallen into an 85-foot well located in a sugar cane field. One appliance with a crew of six men, plus myself, responded. One man was lowered to the bottom of the well in a rescue line and sling. Another rescue line and sling was lowered and the patient secured in the sling. The latter was then raised to the surface, treated for a fractured skull, shock and minor injuries and dispatched to the hospital. The whole operation took 58 minutes, including travel time (6 miles).

The rescue slings were made of webbing, 6 feet long, and secured to a metal triangle. This is in turn secured to the rescue line—100 feet of 2-inch Italian hemp. A length of coiled hose is used at the top of the well to prevent chafing of the rescue line on rock, stone or other irregular surfaces. Illumination where necessary, is provided by a portable searchlight.

Sincerely,
Major A. Bradford
Chief Fire Officer
Barbados, B. W. I.

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Siren alarms have become obsolete because of tighter houses, television noise, and expanding fire districts. Equip each volunteer and professional with an economical PLECTRON Fyrcall Radio Receiver and realize the benefits of a Modern Alarm System.

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SPOKEN INSTRUCTIONS — ECONOMICAL

Transmit from your present fire or police F.M. radio base station. Receivers are "turned on" by a tone (an excellent alarm) which is followed by the voice message.

- FOR ASSIGNED FREQUENCIES IN THE 30-50 & 152-174 MC BANDS
- AVAILABLE FOR ANY TONE FREQUENCY FROM 1000-3000 C.P.S.
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- NEW TONE CIRCUIT ELIMINATES "FALSE" ACTIVATION
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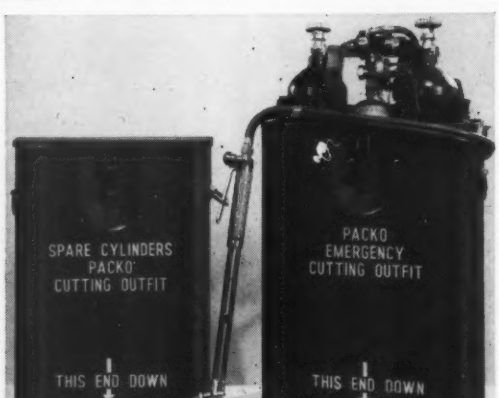

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ABSOLUTELY SAFE AND RELIABLE.

PACKO Emergency Cutting Equipment will be found invaluable. It will enable you to cut away steel barriers in a few minutes . . . enable you to get to the source of a fire quickly . . . enable you to make a rescue . . . that by any other method would require hours.

The unit is self-contained . . . complete with pressure proved cylinders, regulators, hose and non-backfire cutting torch. Order a set today.

Carried by leading fire departments and standard equipment with U. S. Navy and Civilian Defense.

The WELDERS SERVICE CO., Inc. 1033 E. Ohio St., Pittsburgh 12, Pa.

MANUFACTURERS' NEWS

Continued from page 754

tion, dry chemical fire extinguisher manufacturers of Elmsford, N. Y., on British production and marketing of Safety First products under an existing license agreement.

Mr. Graucob addressed the industrial fire protection school held in White Plains, N. Y., by Safety First last spring on fire hazards and fire fighting problems abroad. The school was attended by fire safety officials from leading American industrial companies.

New Yonkers Alarm System

The City of Yonkers, N. Y., has awarded a $465,000 contract to The Gamewell Company, Newton, Mass., for a new decentralized fire alarm system; installation is scheduled to begin in August and completion early next year. The installation will replace a Gamewell system originally installed in 1913. Under decentralization the city is divided into districts, with a separate control unit located at each of five outlying fire stations. These substations are interconnected and all operations are the same as in a system having switchboard facilities at one central point.

Akron Units for Rocket Launchers

In the past, when fires broke out at the Cape Canaveral, Fla., rocket launching site, scientists had to watch helplessly as valuable equipment went up in flames. The heat was so intense that no fire fighting equipment could be manned to prevent complete destruction of rockets and instruments.

The Akron Brass Manufacturing Company, Inc., Wooster, Ohio, has perfected and delivered several automatic monitor nozzles which are mounted at the base of the launching stand. Remote operation, from an observation bunker a quarter of a mile away, can raise, lower, rotate and change stream widths of the units, all directed with the aid of field

glasses. Akron's Unox foam is used with the units, tests having shown it a successful additive in the quenching of intensely hot rocket fuel fires.

J. E. Fishelson, president, says that similar units are also being used at plants of the Atomic Energy Commission, and it is felt that there are many possible future applications for oil refineries, chemical plants and munitions factories where fires are too hot or dangerous to allow human fire fighters to work at close range.

British Tank-Trailer

M. F. Robertshaw Ltd., Bletchley, Bucks, England, has marketed a dual purpose tank-trailer to increase the carrying capacity of Jeep-type vehicles.

Known as the "Camel" Trail Tank, it is of welded construction and carries from 50 to 200 gallons of water as well as 500 to 2,000 pounds of equipment depending on the model.

Literature Available

Wheeler Protective Apparel, Inc., 224 West Huron Street, Chicago 10, Ill., has issued a new illustrated catalog describing its line of protective clothing and safety equipment.

Notifier Corporation, 239 South 11th Street, Lincoln, Neb., has issued a new broadside which illustrates and gives specifications of its most common line of control panels and power supplies. Ask for Form No. 12A-5-58.

The Manufacturing Chemists Association Inc., 1625 Eye Street, N. W., Washington 6, D. C., has issued a 16-page booklet (Data Sheet SD-69) on benzyl chloride. The booklet includes updated information on product safety, fire fighting, first aid, etc., and is available from the Association at 30 cents per copy.

An eight-page bulletin describing its combustible gas analyzer Model "F" is available from **Mine Safety Appliances Co.,** Pittsburgh, Pa.

The Deynor Corp., 1 Depot Place, Mamaroneck, N. Y., has published a four-page leaflet describing its wet water mixer and "Fire Lik" cartridges, as well as their various applications.

An eight-page illustrated brochure (I-19) describing its carbon dioxide extinguishing systems, fire detection equipment and ultrasonic and photo-electric burglar detection systems, has been issued

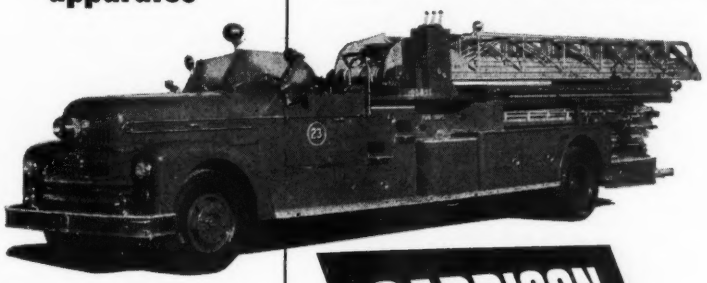
GARRISON

POWER STEERING

provides greater steering control for SEAGRAVE fire fighting apparatus

Now available as factory installed option or in kit form for field installation

Threading speeding fire apparatus through crowded city streets calls for maximum steering control. That's why Seagrave has made Garrison Power Steering available as optional equipment on their fire trucks. Hydraulic power does 80% of the work of steering, giving the operator complete control of the equipment with only slight pressure on the steering wheel. Even the heaviest equipment is easily and quickly maneuvered in and out of close quarters.



Available for other makes and models

Garrison Power Steering is also available for other makes of wheeled, fire fighting apparatus, most makes and models of trucks, wheeled tractors, off-the-road construction equipment and some material handling equipment. Information will be sent upon request.

GARRISON *Manufacturing Co.*

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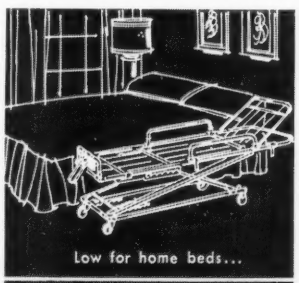
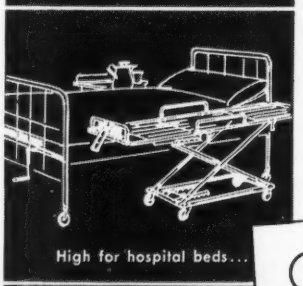
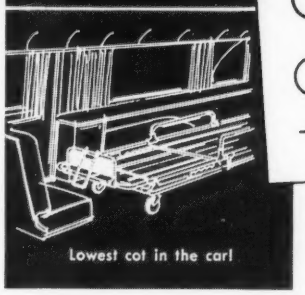

Low for home beds...


High for hospital beds...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ONE COT for ALL LEVELS

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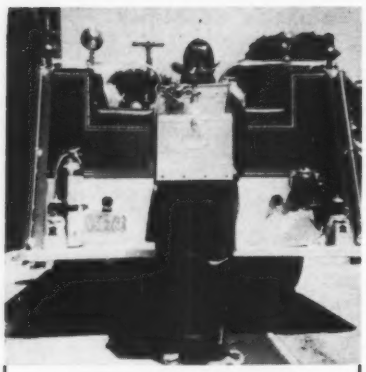

THIS SAVALIFE UNIT FILLS 2 IMPORTANT NEEDS

1. It's a portable steel *CUTTING TORCH*
2. It's a portable *OXYGEN INHALATOR*

The lightweight, compact, low cost SAVALIFE KIT is ideally suited for Fire and Police Depts., Rescue Squads, Civil Defense Units. The unit consists of an oxygen cylinder and a gas cylinder, heavy duty cutting torch, gloves, special split lens goggles, a spark lighter, spare tip and an oxygen inhalator all housed in an aluminum case with 2" criss-crossed web strapping. The torch unit cuts up to 1½" of steel for two hours; the inhalator supplies up to 6 liters of oxygen per minute.

It's ideally suited for hard-to-reach areas, too! Write, wire or 'phone.

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by **Walter Kidde & Co., Inc.**, 675 Main Street, Belleville, N. J. It also contains a chart on the suitability of portable fire extinguishers for use on various types of fires.

John Bean Division, Food Machinery and Chemical Corp., Lansing 4, Mich., has published a pocket-size booklet "Controlling Industrial Fires with John Bean True High Pressure Fog." Fully illustrated and in question and answer form, it is of special interest to plant management, industrial fire chiefs and safety engineers. Write Industrial Sales Department and ask for Booklet L-1448.

Motorola Communications and Electronics, 4501 West Augusta Boulevard, Chicago 51, Ill., has published "You and Your Two-Way Mobile Radio." The 20-page illustrated booklet is an interesting reference primer of the entire field of mobile communications.

The Electric Auto-Lite Co., Toledo 1, Ohio, has published a new definitive study of suppressed ignition to eliminate electrical interference in vehicle two-way radio installations. Included are sections on elimination of spark plug, generator, voltage regulator, distributor and other electrical component interference.

University Loudspeakers, Inc., 80 South Kensico Avenue, White Plains, N. Y., has published a new illustrated 64-page manual, the "Technilog," said to be the most complete guide to sound planning thus far produced. Crammed with technical and product information, charts, tables, etc., it represents the experience of two decades of loudspeaker research, development and practical application. The manual is priced at $1.00.

Graflex, Inc., Rochester 3, N. Y., has published a new booklet "Fire Photography," which describes the uses of photography in the fire service and gives tips on obtaining the best results. The well-illustrated 12-page booklet is available upon request.

Appointments and Promotions

Ray Kubec, formerly general sales manager, Akron Brass Mfg. Co., Inc., Wooster, Ohio, has been elevated to vice president and director of sales. **David Mosley** has been promoted to the post of sales manager.

Fred McPeck has been appointed a special representative of the Miller-Meteor Motor Car Division, Divco-Wayne Corporation, South Elm Street, Bellefontain, Ohio, and will work out of the home office.

William J. Kleinknecht, general superintendent of materials and manufacturing, American District Telegraph Company, has been named assistant to the first vice president. On leave from ADT for the past six months, Mr. Kleinknecht

A CHIEF who knows the game —

Says—"That's it"—Another New Peerless Hose Clamp
Has an automatic lock and automatic release

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The Peerless Hose Clamp was demonstrated at the International Fire Chiefs Convention in 1911 — improvements have been made and new patents obtained at intervals in the past 46 years

NOW Another NEW
Patent Type 9
Weighs 6 pounds less than type E

Just lift the lever, hose is clamped—the water is off—
Lower the lever, clamp released—the water is on—
It is as easy to teach a new man to operate the new clamp as to sign the pay roll.
A ten-year-old boy can release the new clamp if applied by a man weighing 200 pounds

THE NEW PEERLESS HOSE CLAMP
PATENTED U. S. AND CANADA
THE NAME "PEERLESS" REGISTERED TRADE MARK

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served in Washington as assistant director of the Communications Division, Business and Defense Services Administration, U. S. Department of Commerce.

C. D. Ott, who assumed Mr. Kleinknecht's responsibilities during his absence has been promoted to general superintendent, materials and manufacturing.

Andrew Roulston has been named sales manager of the Hale Fire Pump Company, Conshohocken, Pa., manufacturers of fire, industrial and irrigation pumps, it was announced by J. S. Bennett, assistant to the president. Mr. Roulston joined the Hale sales force last fall.

He is a graduate of the United States Naval Academy with an engineering degree and served several years as a submarine officer. Prior to joining the Hale organization, he was active in the engineering and sales of water works and flood control pumps.

New territorial assignments for four district sales managers in the southwestern area have been announced by Four Wheel Drive Auto Company, Clintonville, Wis.

Kenneth Jorgenson, Irving, Tex., is assigned to New Mexico and all of Texas except the Gulf Coast; **Keith Liesch,** Oklahoma City, to Oklahoma, Kansas, and western Missouri; **Glen Pate,** Memphis, Tenn., to Tennessee, Alabama, Arkansas and Mississippi, and **Douglas Reed,** Houston, Tex., to Louisiana and the Gulf Coast of Texas. Mr. Liesch also will continue as manager of FWD's Duncan, Okla., branch sales and service center.

P. O. Peterson, president, Mack Trucks, Inc., Plainfield, N. J., has been elected chairman of the board of directors succeeding **E. D. Bransome** who retired June 5. Mr. Peterson will continue as president and Mr. Bransome will remain a director of the company.

Norseman Marine of Oshkosh, Wis., announces the appointment of the **Northern Commercial Company,** Seattle, Wash., as northwest distributors for the Norseman line of industrial gasoline and diesel-electric power and light plants. Northern Commercial will maintain a complete stock of electric plants up to 35 kw for delivery in Alaska, the Yukon Territory, northwestern British Columbia and western Washington. □□

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- 16 inch 3-blade propeller gives unmatched air moving capacity
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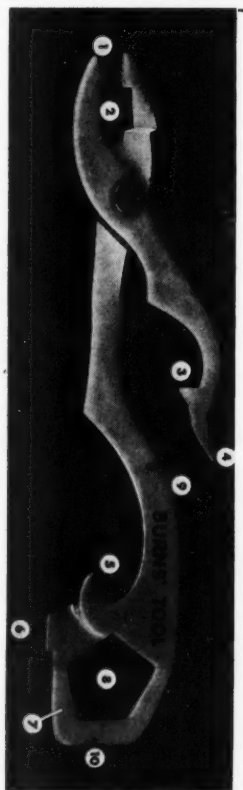

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A STURDY MULTI-PURPOSE INSTRUMENT

Now available is one device which takes over the job of many. The BURNS TOOL is specifically designed to enable every fireman to carry on his person the basic "tools of the trade."

Light-weight, compact and handy best describes this revolutionary device.

The BURNS TOOL is made of Lakite (pearlitic malleable iron), 12½ inches long, weighs 24 ounces and is cadmium plated. It can be carried conveniently in a fireman's coat pocket or on the rig.

Basically a spanner and hydrant wrench, this modernized instrument will be tailored to fit any hydrant nut. Where an established wrench nut is in use, forward with your order a wrench nut size or template.

Priced at only $6.95, the BURNS TOOL will readily become an asset to any fire department.
Check the features, then for prompt delivery or information write to:

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PLANNING A FUND RAISING CAMPAIGN?

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Handford Brown COIN CARDS

The tested and proven way to raise funds. Used successfully by fire departments all over the nation. Holds up to $5.00 in quarters or $3.00 in dimes. Donations can now be given on the popular budget system.

WRITE OR PHONE FOR SAMPLES, DETAILS REGARDING DISTRIBUTION AND PRICES TODAY.

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the round table

discussion of current fire department and fire management problems

The Use Of Portable Radios

THIS IS THE SECOND installment of the Round Table on the use of portable radio equipment.

The generous response from our readers makes it necessary to carry the discussion over to the September issue. The editors will welcome any additional comments on the subject. Address replies to Round Table Editor, FIRE ENGINEERING, 305 East 45th Street, New York 17, N. Y.

The Discussion

James C. Conklin, Chief, Fairless Hills, Pa.: At present, we have one walkie-talkie in service and another such unit on order.

The unit operates on the county fire frequency.

The walkie-talkie is assigned to the officer-in-charge at the scene of an emergency and is carried on our first responding pumper.

We use the unit in our fire prevention and education activities and on occasion during our training periods.

John Pavlik, Chief, West Milwaukee, Wis.: Our department carries three portable radio units; two walkie-talkies and one unit which transmits only.

These units operate on our fire department frequency, which is not shared by another service.

At the scene of emergencies they are usually assigned to officers.

One walkie-talkie is carried on a pumper and the other is carried on the fire chief's car, as is the transmitting unit.

These portable units are also used during drill periods to raise or lower engine pressure when the pumper is out of sight and when training on the drill tower. During in-service plant inspections, personnel call in periodically and are advised of any calls.

John T. Plasket, Chief, Niagara Fire Company, Merchantville, N. J.: We have two portable radio units which operate on a fire service frequency of 154.43 mcs.

One unit is assigned to the fire department officer-in-command. The other would usually be used by the officer inside the fire building or in the rear of it. In case of a major disaster operation, one unit may be used by the fire officer assigned to coordinate with civil defense.

Both portables are carried on the first-due engine as we do not operate a chief's car.

We find the portables useful in most normal fire and drill operations. An inspecting party can carry one into the building. They can be used very effectively on field and dump fires. Probably the most important function is that the handie-talkie allows the chief officer complete freedom of movement about the fire grounds while keeping in constant communication with all apparatus, fire headquarters and police dispatcher (through the fire radio in the police station).

H. C. Pate, Chief, Honolulu, T. H.: We carry fourteen portable radio units, which operate on a fire department frequency only.

They are assigned to chief officers' drivers, captains of five rural companies, captain of fireboat, captain and operator of rescue wagon and operator of tank truck.

One each is carried on the chief officers' vehicles, five rural companies' vehicles, fireboat, and tank wagon; two are carried on the rescue wagon.

These units are used only in emergencies and simulated emergencies.

Francis J. McDonald, Chief, Fall River, Mass.: We have no walkie-talkies in this department but we hope to acquire some at a later date.

E. G. Colglazier, Chief, Pueblo, Colo.: At the present time, we do not carry any portable radio units. However, we did carry two portable walkie-talkies and after several tryouts found they were not too satisfactory in actual fires. They were then turned over to the police department.

In case of a drowning or in rescue work, we sometimes use them to an advantage from shore to boat, etc.

THIS MONTH'S QUESTIONS

How many portable radio units (walkie-talkies, pack sets, etc.) do you carry?

Do these units operate on a fire department frequency or do you share a frequency with another service?

To whom are these units assigned at the scene of an emergency?

On what fire department vehicles are the units carried?

Do you use the units in other than emergency operations? If so, please explain.

N. L. Wheeler, Chief, Miami, Fla.: Our department carries five portable radio units which operate on a fire department frequency.

They are assigned to the chiefs, district chiefs, and rescue units and carried on their vehicles.

Hugh F. Lyon, Chief, St. Louis, Mo.: We carry 17 portable radio units.

On-the-spot frequency does not interfere with normal broadcast of fires from base stations.

These units are assigned to battalion chiefs and other fire department officials and carried on their vehicles.

They are used for emergency work only.

C. H. Cox, Chief, Durham, N. C.: Three walkie-talkies are carried by our department and operate on a fire department frequency.

They are assigned to chief officers and carried on their cars, as well as on the aerial ladder truck.

The units are not used in other than emergency operations.

We have found the walkie-talkies very helpful in many ways at fires. Any department which has a radio system and does not have walkie-talkies, I believe, would find them helpful.

Walter J. Adams, Chief, Rochester, N. Y.: We use six portable walkie-talkies, which operate on a fire bureau frequency.

They are assigned to district and deputy chiefs and carried on their cars.

They are used at all extra alarms or large fires. They are also used when the chiefs are inspecting large buildings while on duty.

Edward F. Crowley, Chief, Belmont, Mass.: We do not carry any portable radio units in the department but ten of these are available through a local civil defense agency and are operated on a civil defense frequency.

They are assigned to the police department and are available to the fire department upon request in units of two or more with operators. The fire department has a direct underground telephone line to the civil defense control center.

William E. McGee, Chief of Training, Buffalo, N. Y.: Fourteen portable units are carried and operate on a fire department frequency.

They are assigned to the commissioner, deputy commissioner, chief of training, division chiefs and battalion chiefs and carried on their cars.

We use these units in training, relays, hose tests, demonstrations, building inspections, cable pulling by electrical division and many other minor uses.

J. H. Freeman, Chief, Tucson, Ariz.: We carry three portable units and have requested another.

They operate on the same frequency as all other fire equipment. We do not share the frequency with another service.

The units are assigned to the officer in charge and to the ladder captain when work is being done on roofs, etc. We also

IN TIME OF NEED...YOU CAN ALWAYS DEPEND ON

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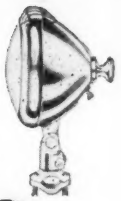
A FAMOUS NAME IN AUTOMOTIVE LIGHTING

Spotlights provide powerful auxiliary lighting. Equip your Fire Engines and Volunteer Fireman's cars with this silent but indispensable partner.

Custom Brackets for all cars and trucks.



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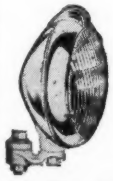

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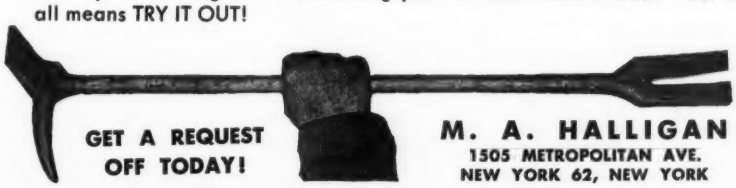

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have "throat mikes" and "ear-sets" which allow these units to be worn with self-contained masks to work in basements, rescue, etc.

They are carried on the ladder truck, central station engine number 1, and rescue and emergency truck.

In-service company building inspections are made using these units, allowing all members of a company to participate in fire prevention and fire fighting inspections.

Donald S. Charles, Chief, Charlotte, N. C.: Four portable radio units are carried by our department and operate on a fire department frequency.

They are assigned to chief officers and their drivers and carried on their cars.

On occasions such as Christmas parades and large public gatherings, they are used by the rescue squad along the routes of parades and at large public gatherings.

Calvin Johnson, Chief, Flint, Mich.: We are contemplating purchasing walkie-talkie radio units in the future. However, we do not have any at the present time.

Thomas P. O'Brien, Assistant Chief, New York, N. Y.: A total of 215 handie talkies are in use and operate on a fire department portable radio frequency of 153.83 mc; none on base or mobile fire frequency. These units are carried as part of the equipment on cars of the chief of the department, assistant chiefs, division and battalion chiefs, rescue units and the field communications unit.

They are also used in training programs, line and cable trucks and department parades.

L. L. Geisler, Chief, Johnson City, Tenn.: Two portable radio units are carried by this department and operate on a fire department frequency of 154.25 mc.

These units are assigned to the defense and rescue squad and are carried on the chief and assistant chief's car.

In case the radio equipment in the station or on the apparatus goes out of order, the walkie-talkies are used until repairs are made. They are also used by chief officers for communication between front and rear of building which is involved in fire.

Steve Taylor, Chief, Boise, Idaho: We carry two portable units which operate on a fire department frequency.

One pack set is assigned to the assistant chief and the handie-talkie to the chief or his representative.

One of the units is carried on the chief's car and one on Engine 5, which is a roving company answering all calls and commanded by the assistant chief.

They are used in other than emergencies but only by the fire department.

C. F. Dreves, Chief, Tampa, Fla.: We carry six portable units, which operate on a fire department frequency.

They are assigned to the district chiefs and rescue crews and carried on their vehicles, as well as on the ladder truck.

The units are used for emergency operations only. □□

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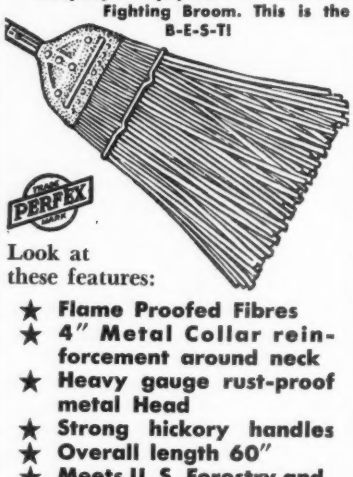

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FYREPEL FIRE FIGHTING EQUIPMENT SHOWN FIREMAN AND CITY OFFICIALS

Newark, Ohio, May 1958, Fyrepel Products, Inc., Newark, Ohio, recently demonstrated their fire fighting equipment at a drill conducted by the local fire department. A house marked for wrecking to make way for new expressway was set afire and the latest fire fighting techniques were employed for the benefit of the department and city officials.

Fyrepel Engineers and sales personnel donned aluminized entry and proximity suits to prove claims of their equipment. Firemen, themselves, then took turns using the clothing and were amazed at the comfort and maneuverability—actually entering a room completely engulfed in flames in a simulated rescue operation. Fire Chief, H. C. Hannum and officials were so impressed that several suits were ordered immediately.

Many tests, similar to this have been conducted throughout the U. S. by Fyrepel personnel. Al Larimer, Fyrepel Sales Manager states that these tests result in sales. "What we claim for this equipment is hard to believe. That's why I, myself, put the clothing to the most severe tests imaginable. All doubts are then removed from the firefighters' minds and their enthusiasm for the suits after using them is a sure sales pitch for Fyrepel."

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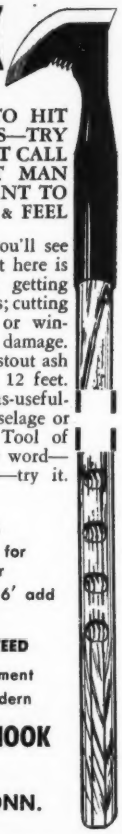

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World-Wide Fire News

Air Force NCO Saves Three Japanese Children from Fire

An Air Force technical sergeant saved the lives of three children and possibly many more persons when fire threatened a residence in Fussa, Japan, early last May.

Sgt. Robert E. Evans, 40th Fighter-Interceptor Squadron, was walking along Ginza Street about 11 p.m. when he noticed a home on fire. A quick check assured him that no one was in the building, but that the flames were blowing towards the occupied house next door.

He aroused its occupants but had difficulty making them understand their predicament. The racket he made in the effort woke up the neighbors, one of whom sent for the fire department. Evans then went to the back of the threatened house, opened a window and removed three children.

Norris T. Morton

Seven States Adopt Atomic Codes

As of July 1, according to a survey of the Atomic Industrial Forum, seven states (California, Connecticut, Massachusetts, Michigan, New York, Pennsylvania and Texas) have adopted comprehensive radiation protection codes. Thirteen states require registration of hazardous radiation sources; 30 states have established committees to study or advise on atomic energy or on radiation protection.

The survey lists three "model" state atomic energy laws; two "model" radiation protection laws and three "model" radiation protection codes.

Norwegian Tanker Burns

There seems to be a run on tanker fires and collisions. Only days before New York's East River incident, which brought death to two men, the 10,945-ton Norwegian tanker Artemis, loaded with 14,000 tons of gasoline, caught fire after a collision with another Norwegian ship, the 2,033-ton Luksefjell, in the Hook of Holland Harbor. All of the tanker's 42 crewmen were saved, but one died later.

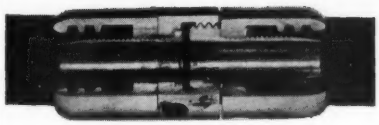
Sparks caused by the collision ignited the tanker's cargo of gasoline intended for the United States Army.

Oil Fire Rages in Iran

Iran, much publicized for its oil resources, has suffered numerous oil fires, one of the most stubborn to control of which raged late in April in one of its richest wells.

Fed by a reservoir of oil 7,755 feet below ground, the blaze burst forth with a tremendous roar, hurling the great drilling rig into the air. Workers fled as oil shot to the surface and ignited.

The well, located 20 miles from Ahwaz,



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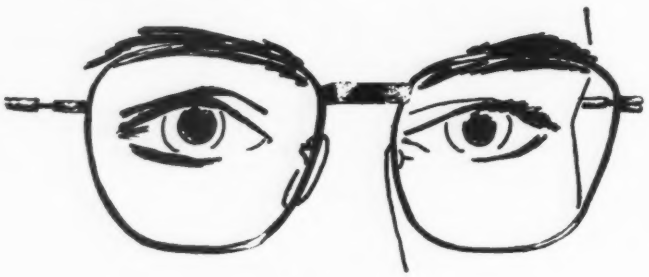

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340 miles southwest of Teheran, was the first strike in the area in 30 years of exploration.

After technicians, civilians and soldiers were unable to control the blaze, a moat was dug around it and a call was sent to the renowned oil fighter, Myron McKinley of Houston, Tex., to fly post-haste to Iran.

From the World News Ticker

In Cologne, Germany, Elevira Soetzner, 11, proved to her friends she was not a coward—and died doing it. She and other youngsters were smoking cigarettes in their secret hide-out when straw on the floor ignited accidentally. One challenged the others to see who could stay in the burning hide-out longest. Elevira won, but lost her life. . . . A Japanese fire chief gave an unusual explanation when the watch tower of his fire brigade burned down. He said, "The fire started at the bottom of the tower, the only place in that area the man on duty couldn't see." . . . Somebody said that Vera Ludford of Hitchin, England, ought to have her head examined. Seems she walked into a store to buy cigarettes and mentioned to the sales girl that she could smell something burning. "You should," the girl told her, "your hair is on fire." Guess is that a cig' thrown out a window landed into her hairdo. . . . Speaking of England, when Mrs. Mary McHale, of Newcastle, was trapped on the second floor of her burning house, passers-by commandeered a double-deck bus and backed it up against the burning dwelling; she stepped out of her bedroom and it drove off. . . . Another Mary—this'un Mary Hartley of Padinham, England, had her house set fire by a snail. My word—the beastie crawled into an electric light socket, causing a short circuit. . . . In Bosung, Korea, Policeman Hu Yoo, who doubles as Bosung's fire detector, was relieved of his post when his home caught fire and burned. . . . A light fire? In Nuremberg, Germany, a truck and trailer loaded with 200 million matches capsized on an autobahn and burst into flames. The driver was injured but escaped. Loss was estimated at $21,000. . . . In Hipston-on-Stour, England, fire engines sireened off to rescue a woman who phoned she was surrounded by smoke and flames. But there was no fire. Seems the woman had dreamed it all up and placed the alarm in her sleep. . . . A fire of undetermined cause in a cell block of Pentridge Prison, Melbourne, Australia, resulted in the removal of about 1,000 prisoners. □□

Homemade Bomb Kills Youth

An Oconomowoc, Wis., high school boy was killed on his sixteenth birthday recently when a homemade bomb with which he and his friends were experimenting blew up. None of the other boys was injured. A fragment of the bomb which he was holding penetrated his abdomen; he died in a local hospital 45 minutes after the mishap.

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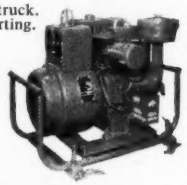

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FIRE COLLEGES

Arizona State Fire School—Oct. 16-18, Phoenix, Ariz., Director, Battalion Chief Jake Siken, Fire Fighting Instruction Supervisor, 49 South First Street, Phoenix, Ariz.

Florida State Fire College—Sept. 8-12—**Units 101,** Tools, Forcible Entry, Breathing Apparatus; **107,** Arson Detection; **201,** Instructor Training. Sept. 15-19—**Units 102,** Hose and Ladders; **106,** Fire Inspection; **202,** Company Officer Training. Sept. 22-26—**Units 103,** Rescue, Ventilation, Salvage and Overhaul; **105,** Fire Apparatus and Pumps; **204,** Fire Fighting Tactics. Sept. 29-Oct. 3—**Units 104,** Fire Streams; **206,** Fire Prevention and Protection; **208,** Fire Department Administration. For information, contact W. H. Barnett, Superintendent, P. O. Box 785, Ocala, Fla.

Indiana State Fire School—Sept. 9-12, Purdue University, Lafayette, Ind. For information contact Professor Shelby Gallien, Director, Public Safety Institute, Purdue University, Lafayette, Ind.

Kansas State Fire School—Oct. 20-23, University of Kansas, Lawrence, Director, Clyde A. Babb, 111 Fraser Hall, University of Kansas, Lawrence, Kansas.

Maryland Annual Short Course for Firemen—Sept. 2-5, University of Maryland, College Park, Md. For information contact Robert C. Byrus, Director, Fire Service Extension, College of Engineering, University of Maryland, College Park, Md.

Morris County, N. J., Fire School—September 2, Morristown Municipal Airport, Morristown; October 7, Denville Fire Headquarters, Denville; November 11, Mill Brook Fire Headquarters, Randolph Township; December 2, Madison Fire Headquarters, Madison. For information, write Robert H. Wright, Publicity Chairman, Long Hill Lane, Chatham, N. J.

New Hampshire Training Program—Sept. 13-14, Meadowbrook Fire Department's Drill Yard, Fitzwillia, N. H. For further information, contact Chief C. E. Pitney, Naval Fire Department, Portsmouth Naval Base, Portsmouth, N. H.

New Mexico Fire Protection Conference—Oct. 13-15, Socorro, N. M.

Ohio State Fire School—Sept. 8-12, Ohio State University, Columbus. For information, contact Wayne C. Jenkins, Chief of Fire Prevention, State Fire Marshal's Office, Wyandotte Building, Columbus, Ohio.

Ontario Fire College—Aug. 25-29—**Administration Course for Senior Fire Department Officers;** Sept. 22-26—Fire Inspection Practices; Sept. 29-Oct. 10—**Techniques of Instruction for Fire Department Instructors;** Oct. 20-24—**Fire Forum for County Fire Co-ordinators.** All courses to be held at Ontario Fire College, Gravenhurst, Muskoka, Ont. For information, contact W. J. Scott, Ontario Fire Marshal, 210 Huron Street, Toronto, Ont.

Pennsylvania Fire School—Apr. 28-Nov. 1. Six distinct courses within each training cycle, held at Pennsylvania Fire School. For information, contact Art Espey, Director, Box 631, Lewistown, Pa.

Southern Wisconsin & Northern Illinois Fire School—Sept. 6-7, Savanna, Ill. For information, write Norton T. Ames, Oregon, Wis.

Suffolk County Fire Chiefs' Field Conference. Annual meeting, Sept. 20-21, Suffolk County Fire Training Grounds, Yaphank, N. Y. For information contact Ernest G. Wilcox, P. O. Box 125, Smithtown, N. Y.

Virginia State Fire School—Aug. 25-29, South Boston, Va. Director, Lawrence Oliver, Supervisor, Fire Service Training, P. O. Box 654, Harrisonburg, Va. □□

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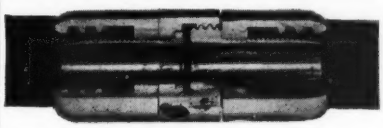

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What's Burning

THE FOLLOWING LIST includes fires of $10,000 and over in the United States and Canada for the period from June 19th to July 17th.

Mayer, Ariz.—Building housing OK Bar and Wells Grocery destroyed.

Hot Springs, Ark.—Barton Building, mercantile and office building, damaged.

Pulaski, Ark.—A. L. Phillips Cotton Gin damaged.

Duarte, Calif.—H & M Banana Co. warehouse destroyed. Short circuit.

Hanford, Calif.—Cal-Craft carpet mills damaged.

Los Angeles, Calif.—R C A Service Co. building destroyed.

Los Angeles, Calif.—Sound Stage at Samuel Goldwyn Studio destroyed.

Marysville, Calif.—Warehouse on Richard Wilbur orchard damaged.

Oakland, Calif. — Figurine Figure Perfection Studio badly damaged. Arson suspected.

Richmond, Calif.—Light oil treating plant of Standard Oil Co. damaged.

San Francisco, Calif.—Motion picture theater at Treasure Island Naval Base damaged.

Bridgeport, Conn.—L. Herman Lavit Co., Inc., wholesale liquor distributing warehouse, heavily damaged.

Millsboro, Del. — Raymond S. Goslee Ford Agency destroyed. Explosion.

Wilmington, Del.—Oil house and rail motor car at Pennsylvania Railroad shops destroyed. Oil-soaked grass.

Jackson, Fla. — Rathborn, Hair & Ridgeway Veneer Co. plant destroyed. Electric motor and switchbox short.

La Grange, Ga.—Two downtown stores destroyed; another damaged.

Roswell, Ga.—Mimosa Hall damaged.

Chicago, Ill.—Gee Co. lumber firm damaged. Lightning.

Streator, Ill.—Four-story Williams Hardware Co. store building extensively damaged. Explosion.

Butler, Ind.—Butler Co., makers of plumbing fixtures, virtually destroyed.

New Castle, Ind.—Rose City Packing Co. heavily damaged.

Horse Cave, Ky.—W. H. Coffey & Son grain mills destroyed.

Guilford, Me.—Hardwood Products Co. plant destroyed.

Jackman, Me.—Section house dwelling of Canadian Pacific Railroad destroyed.

Baltimore, Md.—Building housing State Baking Co., Inc. and Weather-Mastic Inc., damaged.

Baltimore, Md.—Foor Machinery & Chemical Corp. badly damaged. Lightning.

Baltimore, Md.—Western Mill Lumber Co. destroyed. Explosions.

Cecilton, Md.—Barn on old Carpenter Farm destroyed.

Cockeysville, Md.—Fred Williamson Lumber Co. storage building destroyed.

Edgewood, Md.—Bush River Boat Club destroyed.

Laurel, Md.—Acme Market heavily damaged.

Salisbury, Md.—Auction City on Route 13 destroyed.

Boston, Mass.—Pier No. 1, formerly Merchants & Miners Pier, destroyed.

Boston, Mass. — Seventy-year-old Episcopal Church of the Good Shepherd destroyed. Possible arson.

Dracut, Mass.—Beaver Brook Mills, blanket manufacturing firm, damaged.

Foxboro, Mass.—Lord Fox Restaurant, famed colonial dining place near Route 1, destroyed.

Holyoke, Mass.—Boston & Maine Railroad Co. yard considerably damaged.

Lawrence, Mass.—Barn and cattle on Jacob Shlakis produce farm destroyed.

Lawrence, Mass.—McGrath Barn destroyed; adjacent Mount Vernon Nursing Home damaged. Careless smoking.

Norwell, Mass.—Post Office building, Village Spa restaurant, Josselyn's Market and Andre Gordon Insurance Agency, damaged.

Randolph, Mass.—E. C. Young Co., building supplies plant, damaged.

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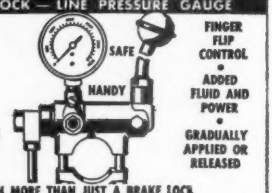

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This action photo from the Lake Geneva Regional News, Wisconsin, shows the Fol-Da-Tank at work. Water from the tanker is being dumped into the Fol-Da-Tank so that it can return to the nearest water supply for another load thereby assuring a constant supply of water from which to work.

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Manufactured Only By

FOL-DA-TANK COMPANY

Box 361, Rock Island, Illinois

Stoughton, Mass.—American Biltrite Rubber Co. warehouse damaged.
Webster, Mass.—Cranston Print Works Co. damaged. Cloth curing machine exploded.
Winthrop, Mass.—Pleasant Park Yacht Club damaged. Defective refrigerator.
Big Rapids, Mich.—Sigma Alpha Delta fraternity house at Ferris Institute destroyed.
Grand Rapids, Mich.—Masterson Building damaged, Arson suspected.
Grand Rapids, Mich.—Weiss Bros. Outlet Shoe building damaged.
Ionia, Mich.—Peschke packing plant damaged.
Midland, Mich.—Tizzit Tavern, including household furnishings, destroyed.
Muskegon, Mich.—Curvecrest roller skating rink destroyed.
Onaway, Mich.—Jolly Kids Garment Co. destroyed.
Royal Oak, Mich.—C. M. Lumber Co. storage shed destroyed.
Sandusky, Mich.—Sandusky Republican-Tribune, weekly paper, damaged.
Bemidji, Minn.—Central Grade School virtually destroyed.
Ackerman, Miss.—Sanders Grocery & Market, Nevie's Flower Shop and Gregory Dry Cleaners destroyed.
Petal, Miss.—Clinton Lumber Co. damaged.
Branson, Mo. — Newport Whitehouse market damaged.
Hollis, N. H.—Two-hundred-year-old landmark known as Farley Farm destroyed.
Nashua, N. H.—Nashual Finishing Co. textile mill heavily damaged.
Somersworth, N. H.—Building housing men's shop of former Mayor Edward S. Charpentier and other businesses damaged.
East Orange, N. J.—Parish house of Christ Episcopal Church damaged.
Hackensack, N. J.—Comfort Coal & Lumber yard damaged.
Newark, N. J.—Our Lady of Angels Roman Catholic Church damaged.
Passaic, N. J.—Jefferson Pharmacy, two dress shops and others damaged.
Succasunna, N. J.—Methodist Church damaged.
Albuquerque, N. M.—Slade Enterprises, food processing concern, heavily damaged.
Buffalo, N. Y.—Kingsbury Street building, housing eight business establishments and dwelling damaged.
Hamburg, N. Y.—Two-story warehouse behind Kronenberg's Department Store damaged.
Slingerlands, N. Y.—Two barns, milk house, machine shop and silo on Anthony Genevesi farm destroyed.
Valley Stream, N. Y.—Green Acres Bowl, bowling alley under construction, damaged.
Walden, N. Y.—Wallkill Machine Shop, known as Toy Shop, damaged.
Asheville, N. C.—Southern Railway roundhouse, housing paper stock, damaged.
Greensboro, N. C.—Carolina Paint & Varnish Co. damaged.
Huntersville, N. C.—Building housing Auten's Garage and Body Shop and Fidler's Grocery and Feed Store destroyed.
Willard, Ohio — Harvey's Save-More Market heavily damaged.
Florence, Ore. — Lakeland Sports Shop and three adjoining stores destroyed.
Lebanon, Ore.—B & Q Lumber Co. destroyed. Faulty saw.
Portland, Ore.—Northwestern Ice and Cold Storage plant damaged. Broken ammonia pipes.
Portland, Ore.—Signal Fire Works Specialty Co. warehouse and 100 dwellings destroyed; 289 dwellings and 20 business establishments damaged. Reported incendiary.
Portland, Ore.—West Slope Lumber Co. and adjoining grocery destroyed.
Rainier, Ore.—Rainier Shingle Mill destroyed.
Scio, Ore.—Purdy Sawmill destroyed.
The Dalles, Ore.—Stadelman Fruit Warehouse destroyed. Grass fire.
Dimock, Pa.—Public School building owned by Elk Lake Jointure School District destroyed. Lightning.
Lock Haven, Pa.—Four buildings at American Aniline Products Co. plant badly damaged.
Mahoney Plane, Pa.—Six dwellings and two business firms damaged.
Philadelphia, Pa.—Atomic Tire & Battery Co. badly damaged.
Philadelphia, Pa.—Old Glen Willow Ice Co. plant destroyed.
Philadelphia, Pa.—Sander Supply Co. plant badly damaged.

Please turn page

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PLUS FEATURES

ALL BRONZE

EQUAL GRIP HOSE CAPS

HIGH COMPRESSION SLEEVES

LEAST SIZE & WEIGHT

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3/4" & 1" ROUND, depressed eyes for spanner wrench use, SATIN finish, either CHEMICAL 8 or 1"—S.I.P.T. 11

COUPLING THREADS, for hose that measures

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1" X 1-1/2"; 1-9/16", 1-19/32", 1-21/32" O. D.

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1952 F7 Ford F800 1956 engine, 500 GPM Champion front mount heated pump, new apparatus body, ladders, suction hose, two reels, 300' booster hose with nozzles, miscellaneous tools and warning devices. $6000.00.

1939 Dodge with Champion 300 GPM midship (new pump) reels with booster hose and nozzles, ladders, suction hose and miscellaneous tools, portable extinguishers and warning devices. $3500.00

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SEALED BIDS will be received by the Borough of Mechanicsburg, Pa., at the office of the Borough Manager, 38 West Main Street, Mechanicsburg, Pa., until 8:00 P.M. E.D.S.T., Sept. 10, 1958 for the sale of one 1942 Diamond T. Fire Truck, Darley equipped with 2 stage 500 G.P.M. pump with 200 gal. booster tank. Sale includes ladders, suction hose, booster hose and nozzle, siren, red lights, etc. Truck is still in service until bid is accepted and can be seen by calling the Borough Manager, PO 6-5431. Bids to be plainly marked "Bid on Fire Truck" and will be opened at the above time, and date. The Borough reserves the right to reject any or all bids.

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Borough Manager

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Experience as a line officer of a full time fire department required, including extensive schooling and training in fire fighting techniques.

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This truck has been housed permanently in heated quarters, driven and maintained by paid firemen and kept in first class operating condition. It may be inspected at the St. Paul Boulevard Fire District firehouse, 433 Cooper Road, Rochester 17, N. Y. (Town of Irondequoit) or detailed specifications available upon request.

Direct all inquiries to either Commissioners Victor H. Pillen, 294 Seneca Park Avenue, telephone Fillmore 2-9524 or George C. Marks, 3565 St. Paul Blvd., telephone Congress 6-4051, Rochester 17, N. Y.

FOR SALE

Ahrens-Fox 750 GPM quadruple combination pumper for sale. Model U.M. 4 1929. Equipped with piston pump, approximately 200 ft. of hand ladders, six cylinder motor, and most of the standard equipment. Inquire Mr. Thomas Burns, Safety Director of the City of Cheviot, Ohio. Post Office address: City Hall, Cheviot 11, Ohio.

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Charleston, S. C. — Grading equipment destroyed. Grader plowed up natural gas pipe.
Louden, Tenn.—Court Theater and jewelry store damaged.
Bonham, Tex.—Cantrell Motors Co. damaged.
Barton, Vt.—Raoul-Wood Mfg. Co. mill destroyed; dwelling of Ora White damaged.
Fort Worth, Tex.—Manney Co. and Mannasco Fabrics damaged.
Petersburg, Va.—Arnold Pen Co. damaged. Explosions.
Eureka, Wash. — Kent Farms buildings destroyed.
Toppenish, Wash. — Toppenish warehouses, bowling alley and apartment dwelling destroyed.
Vancouver, Wash.—Art Henges Auto Parts destroyed. Explosion.
Vancouver, Wash.—Corrosion Control Plastic Processing firm, Columbia Ice Cold Storage and Washington Farmers Cooperative destroyed. Explosions.
Weston, W. Va.—Cimmings Motor Sales Agency destroyed.
Weston, W. Va.—Vacant factory building damaged.
Nelson, B. C.—Peebles Motors Ltd., including 40 automobiles, destroyed.
Vancouver, B. C.—E. L. Sauder Lumber Co. destroyed.
Bothwell, Ont.—Bothwell Wood Products plant, manufacturers of fish boxes, baskets and charcoal, destroyed. □□

Coming Events

Sept. 8-11—**New York State Fire Fighters Association.** Annual meeting, Long Beach, L. I., N. Y. Secretary-treasurer, William Loehr, 1638 Midland, Syracuse, N. Y.

Sept. 11-13 — **Westchester County Volunteer Firemen's Association.** Annual meeting. Dobbs Ferry, N. Y. Secretary, Harold E. Ackerman, 60 Concord Avenue, White Plains, N. Y.

September 14—**Great Lakes Association of Fire Chiefs.** Annual meeting held in conjunction with the International Association of Fire Chiefs, Los Angeles, Cal. Secretary-Treasurer, Chief Elmer Stough, 605 - 4th Street, Lorain, Ohio.

September 15—**Pacific Coast Inter-Mountain Association of Fire Chiefs.** Annual meeting held in conjunction with the International Association of Fire Chiefs, Los Angeles, Calif. Secretary-Treasurer, Jay W. Stevens, Merchants Exchange Building, San Francisco.

September 16-19—**International Association of Fire Chiefs.** Annual meeting, Los Angeles, Calif. Secretary-Manager, B. Richter Townsend, 232 Madison Avenue, New York 16, N. Y.

September 18—**Delaware Fire Chiefs Association.** Semi-annual meeting, Citizens' Hose Company No. 1, Smyrna, Dela. Secretary, Charles H. Jester, Camden, Dela.

Sept. 19-20—**Delaware Volunteer Firemen's Association.** Annual meeting, Smyrna, Dela. Secretary, E. Reynolds Bradley, Smyrna, Dela.

Sept. 24-27—**California State Firemen's Association.** Annual meeting, Santa Barbara, Cal. Secretary, E. L. Albrecht, Sr., 755 - 17th Street, San Bernardino, Cal.

Oct. 17-19—**Nebraska State Volunteer Firemen's Association.** Annual meeting, North Platte, Neb. Secretary-Treasurer, Russell D. Salak, Box 312, Schuyler, Neb.

Nov. 6-8—**Washington Fire Commissioners Association.** Annual meeting, Bellingham, Wash. For information contact Fred Dustin, 2195 Mt. Baker Highway, Bellingham, Wash.

Nov. 13-15—**International Rescue and First Aid Association. Annual** meeting, Jacksonville, Fla. Executive Director, Max L. Spray, 101 North Alfred Street, Alexandria, Va. □□

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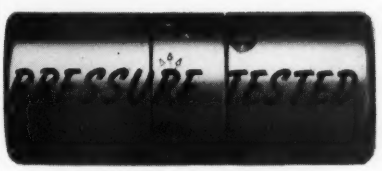

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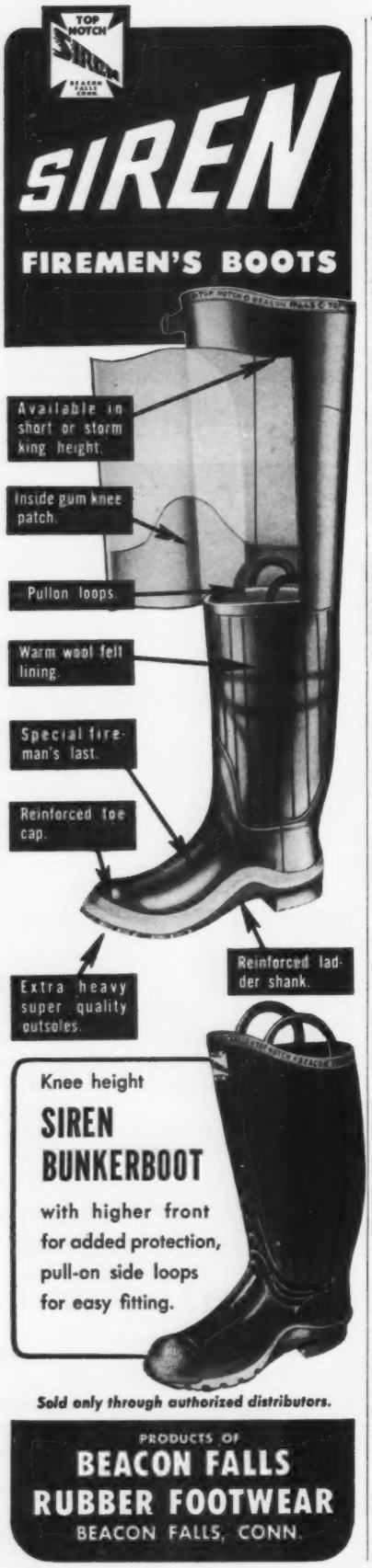

ADVERTISING INDEX

ACME PROTECTION EQUIPMENT CO. 640
AKRON BRASS MFG. CO., INC. 695–706
ALLWAY COUPLING CO. 809; 811; 813; 815
ALUMINUM LADDER CO. 637
AMERICAN DISTRICT TELEGRAPH CO. 652
AMERICAN FIRE APPARATUS CO. 633
AMERICAN FIRE PUMP CO. 615
AMERICAN LA FRANCE CORP. 606–607
AMERICAN RUBBER MFG. CO. 655
ANTREX CORP. 800
APPROVED FIRE EQUIPMENT CO., INC. 791
AQUATIC EQUIPMENT CO. 780
ARDMORE PRODUCTS 625
ARGUSLITE CO. 812
ATLAS SAFETY EQUIPMENT CO., INC. 649
AUDIO EQUIPMENT CO., INC. 611

B & C PRODUCTS CO. 787
BATROW LABORATORIES, INC. 785
BEACON FALLS FOOTWEAR 816
BEAN MFG. DIV., JOHN; FOOD MACHINERY & CHEMICAL CORP. 588–589
BI-LATERAL FIRE HOSE CO. 634
BLACKHAWK MFG. CO. 619
BLACKINTON & CO., INC., V. H. 769
BOARDMAN CO. 609
BODY GUARD MFG. CO. 812
BOMGARDNER MFG. CO. 801
BOSTON COUPLING CO. 799
BOSTON WOVEN HOSE & RUBBER CO. 594
BRAXMAR CO., C. G. 661
BULLARD CO., E. D. 653
BURNS TOOL CO. 805

C. D. PIKE & FIRE HOOK MFG. CORP. 809
CAIRNS & BRO., INC. 764
CARPENTER MANUFACTURING CO. 627
CHAMPION SPRAYER CO. 789
CHRISTOPHER CO. 592–593
CIRCUL-AIR CORP. 759
CLAYTON SKIFFS, INC. 610
COIN SAVERS 815
CONSOLIDATED WELDING & ENGINEERING. 795
CORNELIUS CO. 799

DARLEY & CO., W. S. 622
DELCO-REMY, DIV. GENERAL MOTORS CORP. 614
DELEHANTY CORRESPONDENCE SCHOOL ... 808
DETROIT DIESEL ENGINE DIV., GENERAL MOTORS 762
DEYNOR CORP. 790
DU MONT LABORATORIES INC., ALLEN B. . 773
DUO-SAFETY LADDER CORP. 659
DU PONT DE NEMOURS & CO. (INC.), E. I. 646

E & J MANUFACTURING CO. 639
EAGLE SIGNAL CORP. 645
EASTMAN CO., SAMUEL 796
ELECTRONIC PROTECTION, INC. 763
ELKHART BRASS MFG. CO., INC. 616–617
EUREKA FIRE HOSE; DIV. U. S. RUBBER CO. 753
EVERSON-ROSS 810

FABRIC FIRE HOSE CO. 585
FAIRBANKS, MORSE & CO. 798
FALCON ALARM CO., INC. 801
FEDERAL SIGN & SIGNAL CORP. 583
FERNO MFG. CO. 803
FIRE FIGHTER TRUCK CO. 795
FIRETOX 813
FOL-DA-TANK CO. 776; 813
FORD MOTOR CO. 665
FOUR WHEEL DRIVE AUTO CO. ..... Back Cover
FYREPEL PRODUCTS INC. 808
FYR-FYTER CO. 739–742

GAMEWELL COMPANY 668
GARRISON MFG. CO. 803
GAS ARC SUPPLY 804
GENERAL ELECTRIC CO. 648
GLOBE MFG. CO. 643
GMC TRUCK & COACH DIV., GENERAL MOTORS CORP. 641
GOLD CREST SAFETY EQUIPMENT CORP. ... 778
GOODALL RUBBER CO. 608
GOODRICH INDUSTRIAL PRODUCTS CO., B. F. 587
GRAFLEX, INC. 767
GREENBERG'S SONS, M. 776
GRINNELL CO., INC. 656

HALE FIRE PUMP CO. 595; 667
HALLIGAN, M. A. 807
HALPRIN SUPPLY CO. 792
HAMILTON RUBBER MFG. CORP. 590
HANDFORD BROWN CO. 806
HANNAY & SON, INC., CLIFFORD B. 620
HARRINGTON SIGNAL CO. 778
HARRON LABS 792
HEIN-WERNER CORP. 600–601
HERCULES MOTOR CORP. 638
HESS & EISENHARDT CO. 624
HEWITT-ROBINS 766
HIGH FOG PUMP CO. 626
HOOSIER TARPAULIN & CANVAS GOODS CO., INC. 786
HOWE FIRE APPARATUS CO. 599

INDUSTRIAL RADIO CORP. 774
INTERNATIONAL HARVESTER CO. 612–613

JANESVILLE APPAREL CO. 794

KELLAM MFG. CO. 804
KEYSTONE VALVE CORP. 657
KIDDE & CO., WALTER 779
KOHLER CO. 783

LANE, E. B. 809
LEECE-NEVILLE CO. 632

McCANN PRODUCTS CO. 663
McDERMOTT CORP., J. A. 793
McINTIRE BRASS WORKS, F. N. 630
MACCHI & CO. 796
MACK FIRE APPARATUS 596–597
MANN EDGE TOOL CO. 798
MARINE PRODUCTS CO. 785
MARLOW PUMPS, DIV. BELL & GOSSETT CO. 658
MAXIM MOTOR CO. ..... Inside Front Cover
MEMCO AERIAL LADDER CO. 756
MIDWESTERN SAFETY MFG. CO. 621
MILLER-METEOR MOTOR CAR DIV., DIVCO-WAYNE CORP. 647
MILWAUKEE ELECTRONIC TOOL CORP. 757
MINE SAFETY APPLIANCES CO. 586
MINNESOTA MINING & MFG. CO. 635
MONITORADIO DIV., I. D. E. A., INC. 770
MORNING PRIDE MFG. CO. 782
MOTOROLA COMMUNICATIONS & ELECTRONICS, INC. 598
MOUNTAIN STATES EQUIPMENT CO. 805
MUELLER CO. 784
MYERS & BRO. CO., F. E. 604

NATALE MACHINE & TOOL CO. 761
NATIONAL FOAM SYSTEM, INC. 644
NATIONAL TRADING CO. 787
NATIONAL TROPHY SALES, INC. 811
NAVAL CO. 797
NIELSON-RIONDA, INC. 782
NORTH AMERICAN SIGNAL CO. 783
NOTIFIER CORP. 784

OBERDORFER FOUNDRIES, INC. 797
ONAN & SONS, INC., D. W. 768
OXYGEN EQUIPMENT & SERVICE CO. 666

PACIFIC MARINE SUPPLY CO. 794
PACIFIC REFLEX SIGNS 791
PARCO PRODUCTS CO. 664
PARKHURST, RICHARD M. 810
PERFEX 808
PHON ALARM DIV., ANGELUS INDUSTRIES, INC. 591
PIONEER GEN-E-MOTOR CORP. 800
PIRSCH & SONS CO., PETER .... Inside Back Cover
PLECTRON CORP. 802
PORTER, INC., H. K. 777
POTTER-HORN, INC. 811
POWER EQUIPMENT CO. 812
POWHATAN BRASS & IRON WORKS 623
PYROTRONICS DIVISION, BAKER INDUSTRIES, INC. 780

QUAKER RUBBER DIVISION, H. K. PORTER CO., INC. 775

RADIO CORPORATION OF AMERICA 629
REESE, S. M. 808
REPUBLIC RUBBER DIV., LEE RUBBER & TIRE CORP. 618
ROCKWOOD SPRINKLER CO. 602–603
ROSS VALVE MFG. CO., INC. 790
RUPERT SAFETY BELTS, DIV., RUPERT PARACHUTE CO. 786
RUSSELL UNIFORM CO. 813

SAFETY CLOTHING & EQUIPMENT CO. 788
SAFETY FIRST PRODUCTS CORP. 810
SCHNECK TEXTILE FIBRE CO. 789
SCOTT AVIATION CORP. 765
SEAGRAVE CORP. 631
SHARPSVILLE STEEL FABRICATORS, INC... 660
SMITH & CO., D. B. 605
S-T HYDRANT WRENCH CO. 812
STEPHENSON CORP. 793
STERLING SIREN FIRE ALARM CO., INC. ... 788
SUPERIOR COACH CORP. 651
SUPER-VACUUM MFG. CO., INC. 758

U-C LITE MFG. CO. 810
UDDSTROM CO., P. R. 636
UNITY MFG. CO. 807
UNIVERSAL FIRE APPARATUS CORP. 654
UNIVERSITY LOUD SPEAKERS, INC. 650

VALLEY FIRE TRUCK CO. 760

W-B MANUFACTURING CO. 772
WATEROUS COMPANY 642
WAUKESHA MOTOR CO. 628
WELDERS SERVICE CO., INC. 802
WENTWORTH-FORMAN CO., INC. 809
WHELEN ENGINEERING CO. 781
WHERE TO BUY 743–752
WILLSON PRODUCTS DIV., RAY-O-VAC CO. .. 771
WINCHARGER CORP. 811

YOUNG FIRE EQUIPMENT CORP. 662

.. 794

.. 804
.. 657
.. 779
.. 783

.. 809
.. 632

.. 663
.. 793
.. 630
.. 796
96–597
.. 798
.. 785

.. 658
Cover
.. 756
.. 621

.. 647
.. 757
.. 586
.. 635
.. 770
.. 782

...598
.. 805
. 784
. 604

. 761
. 644
. 787
. 811
. 797
. 782
. 783
. 784

. 797
. 768
. 666

. 794
. 791
. 664
. 610
. 808

. 591
. 800
Cover
. 802
. 777
. 811
..812
. 623

. 780

. 775

. 629
. 808

. 618
2–603
. 790

. 786
. 813

788
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789
765
631
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771
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662

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PAGE (S

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